AL.2.1986-276

VOLUME 1

SCHOOL BUILDINGS SERVICES INFORMATION NEEDS ASSESSMENT

School Buildings Services

Alberta
EDUCATION

DDN 6579077

National Library of Canada
Bibliothèque nationale du Canada

CANADIA
JUL 10 1

VOLUME 1

SCHOOL BUILDINGS SERVICES
INFORMATION NEEDS ASSESSMENT

16 APRIL 1986

EXECUTIVE SUMMARY

The purpose of this report, an Information Needs Assessment was to prepare a foundation upon which the School Buildings Services Branch can undertake a plan for office automation. An interesting yet complicating parameter during the study was that change in terms of the use of microcomputers and information storage was already in progress, and equipment was ordered.

This exercise is complimentary to the work of two senior committees within the Department:

(a) the Electronic Information Processing Needs Study Steering Committee which is charged with the responsibility of steering a study by an external consultant which will provide a background rationale needed to support tactical decisions made with respect to the selection of hardware, software, and systems. It is not to provide a data model for a departmental information system;

(b) the Electronic Information Processing Task Force which is charged with the responsibility of examining through its own investigation using a review of literature and an examination of existing Departmental functions with respect to electronic information processing.

This study of the School Buildings Services Branch provides an examination of information flows and activities which can be assisted with automation at the level of a Branch, consequently adding a dynamic bridge to the other two studies.

This study was conducted in two phases. The first phase included all components noted in the first five sections, in essence a background for the rest of the examination. It involved an examination of the organization of the School Buildings Services Branch, its functional objectives, the physical environment of the Branch, and the data and information flows within it.

The second phase involved a time log survey and suggestions for future preparation of any plan for automation of the activities of the Branch.

Digitized by the Internet Archive
in 2017 with funding from
University of Alberta Libraries

https://archive.org/details/schoolbuildingss00albe

This report contains the following sections:

Section 1. Introduction: wherein the purpose of the assignment and research activities are described; and the acronym GRATIS is discussed.

Section 2. The School Buildings Services Branch: wherein the organization, operations, key responsibility areas (KRA's), and physical environment of the Branch are described.

Section 3. Flows and Processes: wherein functions, processes, and data and information flows are described.

Section 4. Analogue of the Branch: wherein a model of the Branch is prepared and displays what occurs within the Branch in terms of the acronym GRATIS.

Section 5. Observations and Comments: wherein a summary of background is made to complete the overview prerequisite to an analysis of time spent on certain activities.

Section 6. Time Log Survey: wherein a survey of all members of the Branch ascertained what portions of each member's time was spent during the conduct of specified activities.

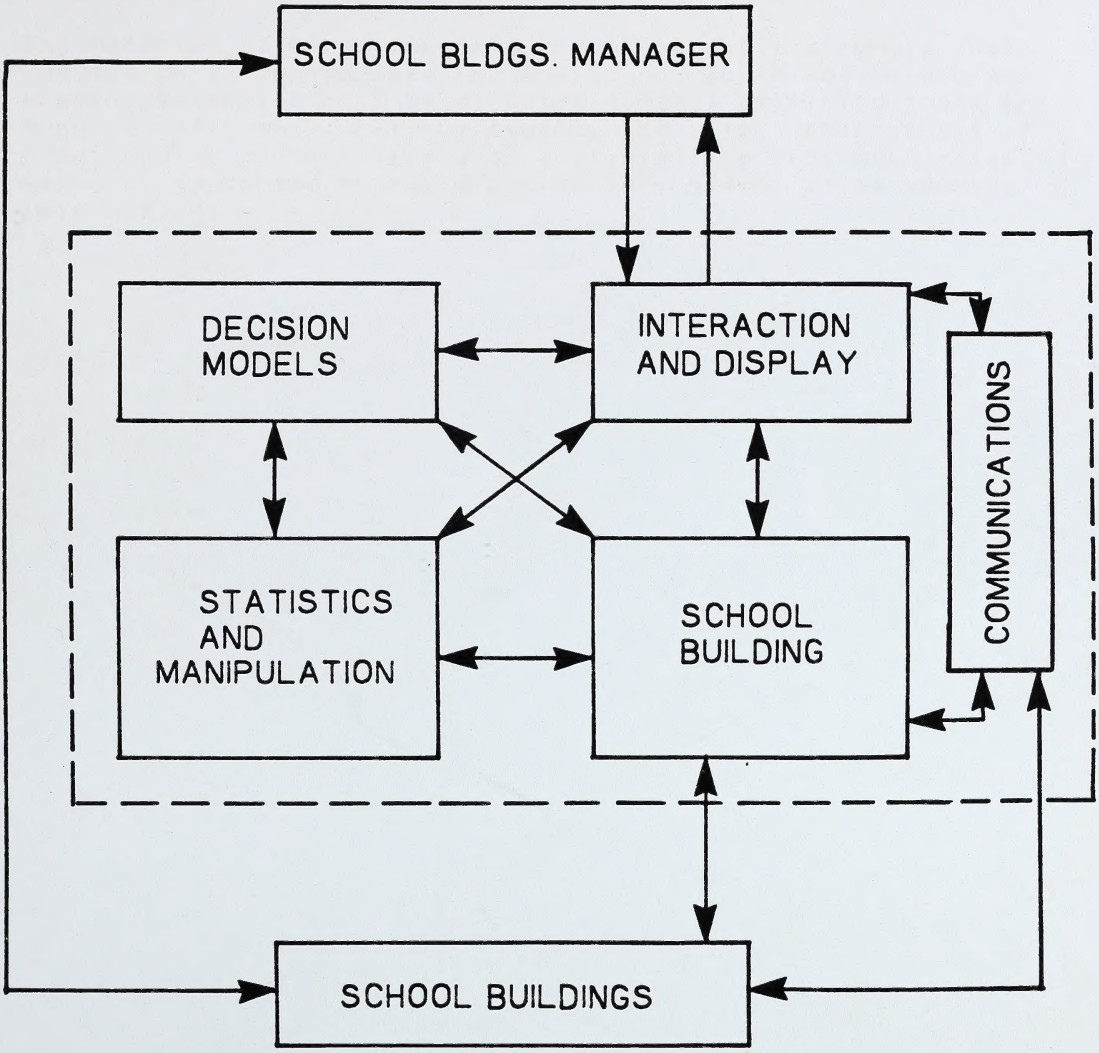
Section 7. Applications and Potential Alterations: wherein general automation requirements of the Branch and its two sections are considered.

Section 8. A Framework for a Plan of Automation: wherein the report is concluded with comments about future directions, leading to the formulation of a model of a school buildings capital decision support system to be used within the Branch. The model is noted in Figure ES 1 and acknowledges that the development of software is rapidly approaching the level of integration of functions that are displayed. The implication is that the Branch and the Department both will have an opportunity to consider what configurations and redevelopment are appropriate. An outline of a method by which planning for any automation is included in Section 8.

The intention of proposing a decision support model includes an assumption that the Department too will desire to have linkages between the School Buildings Services Branch and other groups both within and external to the Department. The type of local area network envisaged for the Branch is displayed in

FIGURE ES 1

SCHOOL BUILDINGS CAPITAL DECISION SUPPORT SYSTEM MODEL



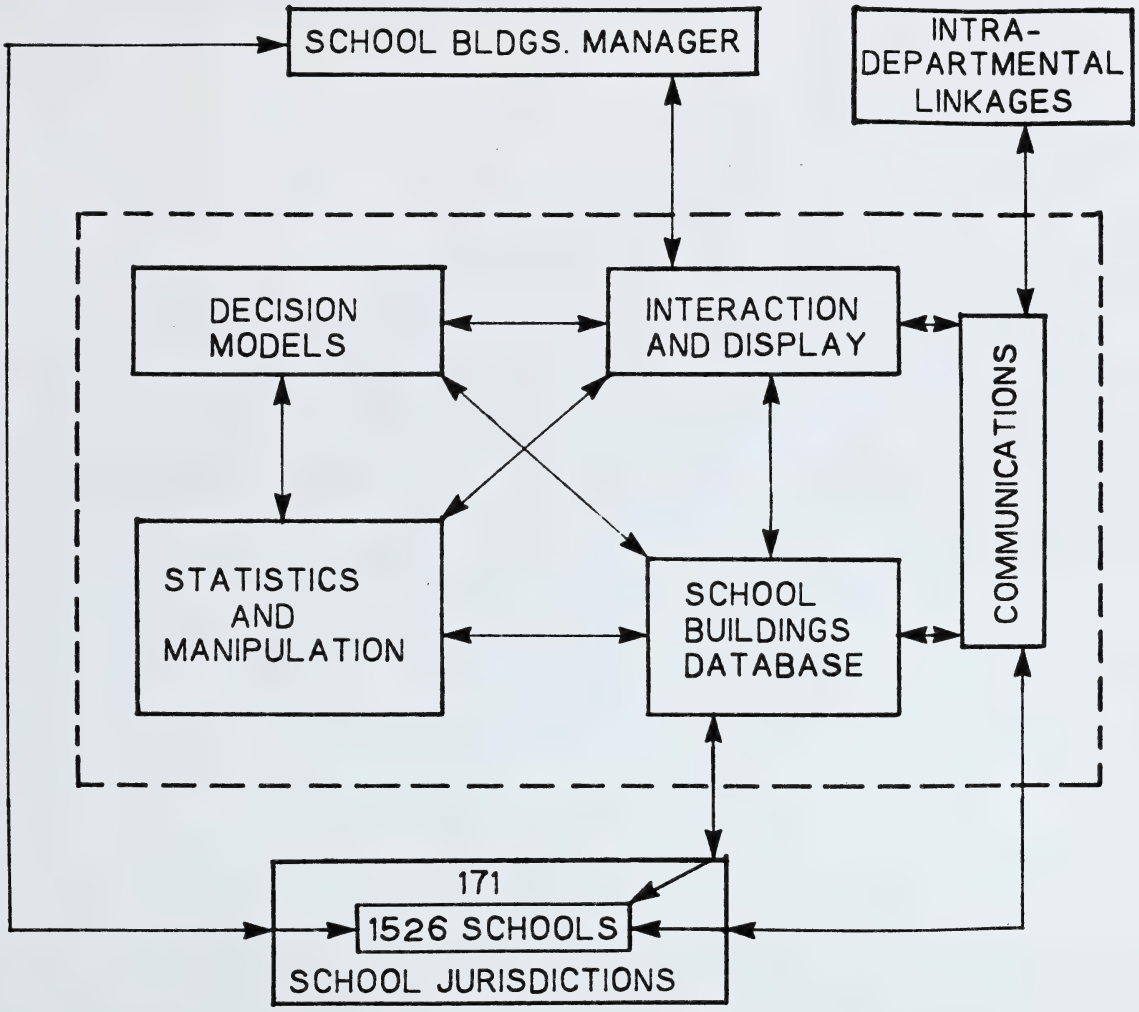
BASED ON TREACY (1985)

Figure ES 2. A concept of an extended network is displayed in Figure ES 3.

The material gathered for this report suggests strongly that automation is appropriate for the School Buildings Services Branch. Attention must be directed towards attaining goals that support efficiency, relieve tedium, and offer the prospect of transforming current levels of analysis into more sophisticated methods, supported by rapid access to substantial warehouses of information.

FIGURE ES 1

SCHOOL BUILDINGS CAPITAL DECISION SUPPORT SYSTEM MODEL



BASED ON TREACY (1985)

FIGURE ES 2

BRANCH LOCAL AREA NETWORK

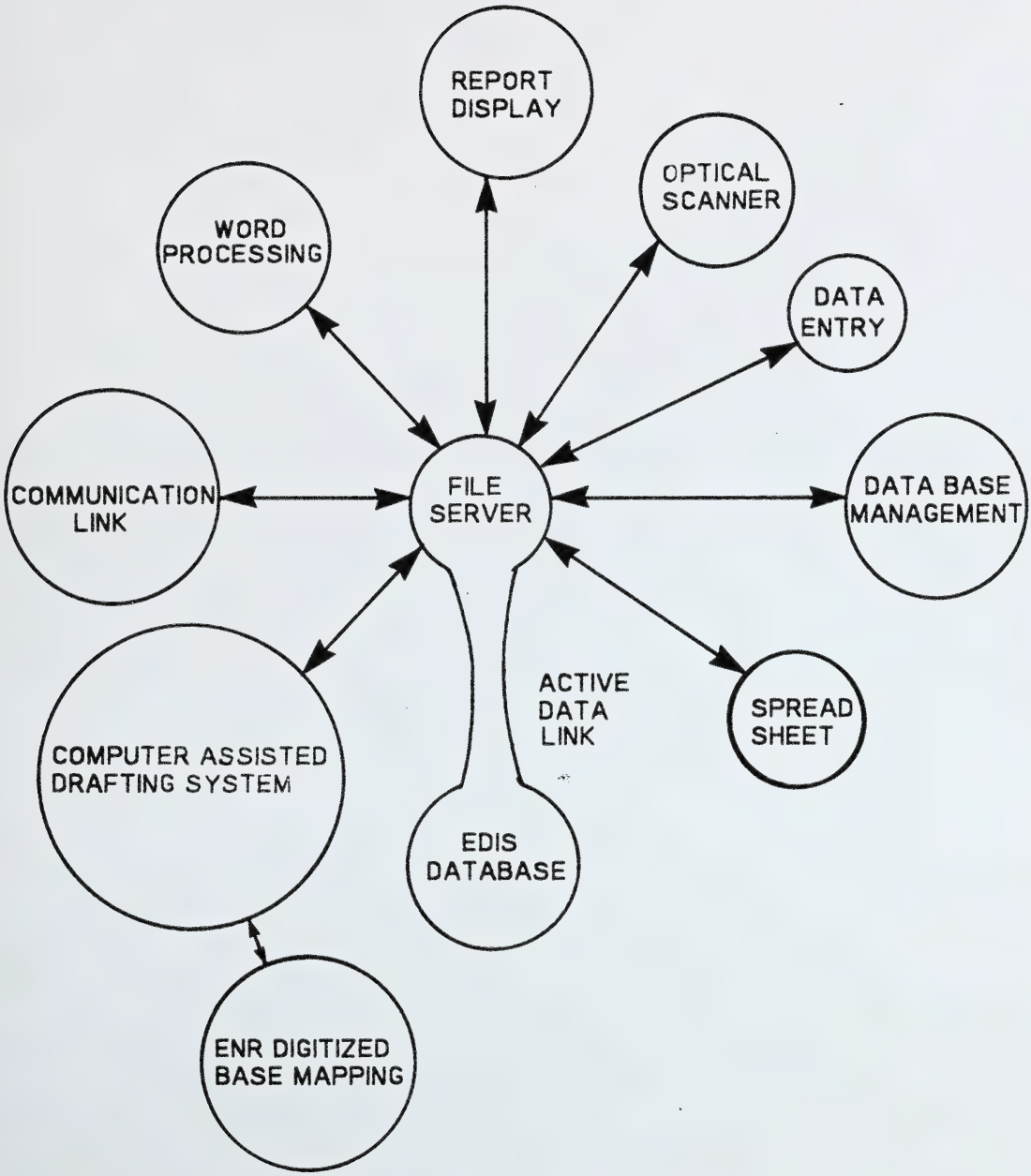


FIGURE ES 3

EXTERNAL LINKAGES

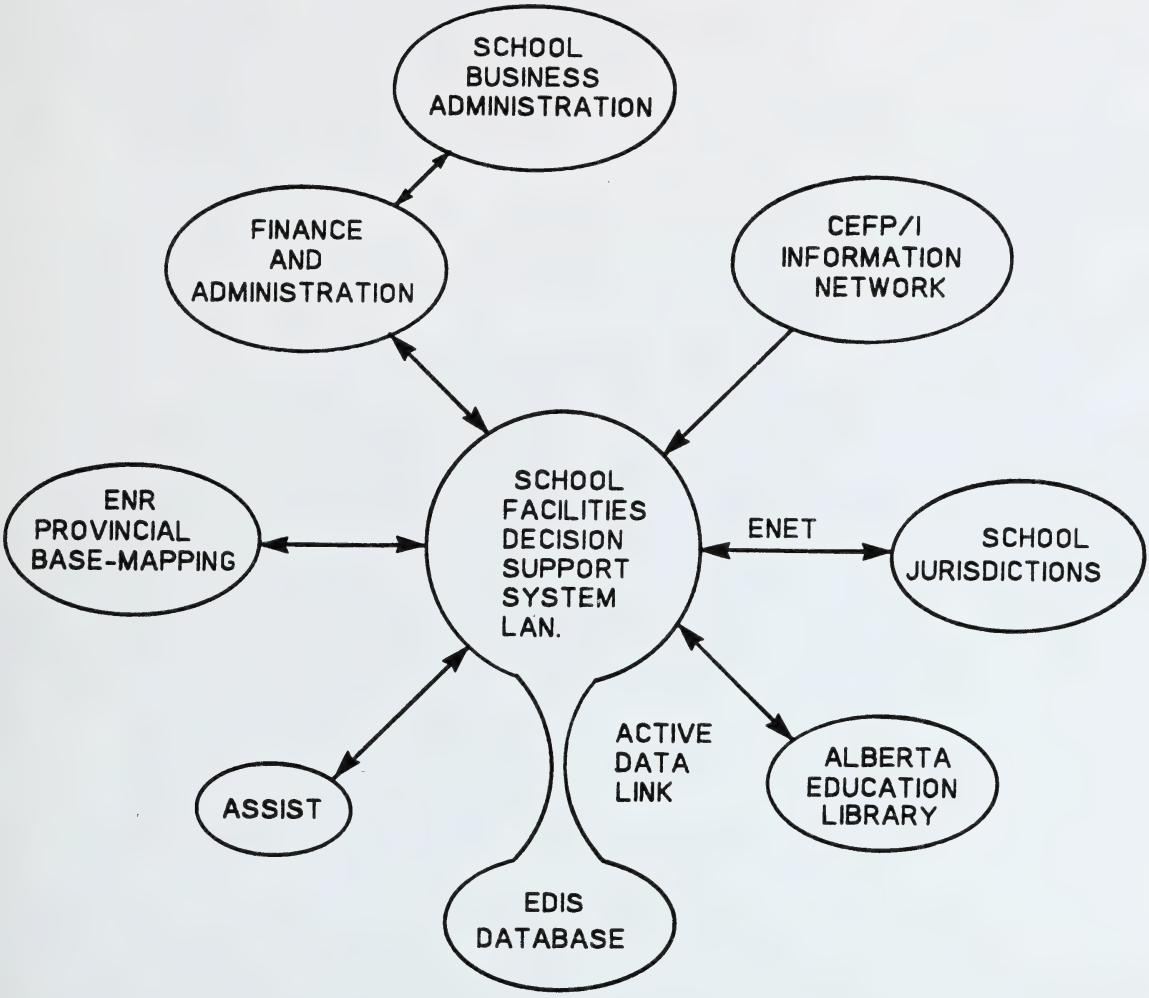


TABLE OF CONTENTS

VOLUME 1. INFORMATION NEEDS ASSESSMENT REPORT

		Page
	EXECUTIVE SUMMARY	ES 1
	TABLE OF CONTENTS	i
SECTION 1.	INTRODUCTION	1
SECTION 2.	THE SCHOOL BUILDINGS SERVICES BRANCH	3
SECTION 3.	PROCESSES AND FLOWS	8
SECTION 4.	ANALOGUE OF THE BRANCH	16
SECTION 5.	OBSERVATIONS AND COMMENTS	17
SECTION 6.	TIME LOG SURVEY	20
SECTION 7.	APPLICATIONS AND POTENTIAL ALTERATIONS	27
SECTION 8.	A FRAMEWORK FOR A PLAN OF AUTOMATION	31

TABLE OF CONTENTS

VOLUME 2. APPENDICES

		Lead Appendix
APPENDIX A.	An Overview of Responsibilities and Activities of Each Position in the School Buildings Services Branch	A1
APPENDIX B	Data Acquired from BQRP Process	B1
APPENDIX C	Data Acquired from Sample Facility Evaluation Reports	C1
APPENDIX D	EDIS Database Reports	D1
APPENDIX E	Forms by which Data are Acquired by the School Buildings Services Branch and Summary of Data Acquired by Each Form	E1
APPENDIX F	Capital Plan and Status of Debenture Reports	F1
APPENDIX G	Enrolments: Summary Tabulations	G1
APPENDIX H	Summary Sheet for Calculating Capacity, Operating Capacity, Enrolments, Utilization, and Utilization Factors	H1
APPENDIX I	Summary of Pilot Spreadsheet for Operating Capacity, Total Enrolment, Utilization, U Factor, E Factor, and Product of U Factor and E Factor	I1
APPENDIX J	Energy Conservation Data/Information	J1
APPENDIX K	Typical Material Supplied by the School Buildings Service Branch for the Department's Annual Reports	K1

TABLE OF CONTENTS
(continued)

VOLUME 2. APPENDICES

		Lead Appendix
APPENDIX L	Fire Warden Information	L1
APPENDIX M	'Field Packages'	M1
APPENDIX N	G.R.A.T.I.S. Survey Components	N1
APPENDIX O	Linkages by Position: Intra-Branch/ Branch - Department/Branch - External to Department	O1
APPENDIX P	Time Spent on G.R.A.T.I.S. by Individuals and Groups	P1
APPENDIX Q	Minimum Requirements for a Branch System	Q1
APPENDIX R	Relevant Sources of Electronic Information	R1
APPENDIX S	Sources of Information/Assistance	S1
APPENDIX T	List of Data Acquired by Capital Program Area	T1
APPENDIX U	Potential School Decision Model	U1

SECTION 1

INTRODUCTION

The purpose of the exercise is to identify what are the information needs of the School Buildings Services Branch prior to formulating any plans for office automation. The approach adopted in this review was that the School Building Services Branch was a subcomponent of a system within a larger system, i.e. Alberta Education, and thus the Branch could be described in terms of a system. When viewing data and information flows in this context it implies that activities occur at various nodes and sub-nodes within the system and that data and information are transmitted along definable paths of communication. It acknowledges that there are formal mechanisms by which activities within the Branch are classified.

The first phase of the investigation examined in general terms the Branch, and the data and information flows within it.

Items reviewed were:

(i) the organizational structure of the Branch;
(ii) the functional purpose of the Branch;
(iii) activities within the Branch;
(iv) the routes of communications, and linkages between nodes/sub-nodes of activities, as well as data and information storage areas in the Branch. The initial consideration was the following: Nodes were associated with individuals or groups who prepare major activities in terms of accomplishing functions. Sub-nodes were associated with others within the Branch who provide support functions of significance to information management.

The above mentioned activities permit a detailed review of data and information flows. The acronym GRATIS has been coined for this exercise. GRATIS stands for:

G - generation of primary data;
R - retrieval of data/information from a secondary source, i.e. a storage area;
A - acquisition of data/information from a primary source, i.e. recipient of distributing agent;
T - transformation of data into usable information;
I - interaction, (i.e.) communicating/disseminating;
S - storage of data/information on an appropriate medium.

The outcome has been the preparation of an analogue of the Branch, or model of the network within which data and information are acquired, generated, transformed, stored, retrieved and disseminated. Such a description is a first step towards identifying what activities lend themselves to automation.

The second phase involved a time log survey and suggestions for future preparation of any plan for automation of the activities of the Branch.

SECTION 2

THE SCHOOL BUILDINGS SERVICES BRANCH

Background

Taken from its own Mission Statement, the Alberta Department of Education administers the funding of school facilities and operations in such a manner as to maximize local autonomy and educational equality. This provides the School Buildings Services Branch with the purpose of administering departmental policies pertaining to the provision of new schools, and the maintenance and upgrading of existing school buildings. Thus, the Branch has three main functions:

(i) to allocate funds for school buildings;
(ii) to provide school facility planning capabilities to support local school boards;
(iii) to establish improvements in departmental policy and procedures.

To accomplish the Branch's purposes, formal procedures have been established. School boards may requisition funds through application, addressed to three programs that the Branch administers. Response to the applications invokes the activities of the School Buildings Services Branch, which provides administrative support for the School Buildings Board. By definition, the function of responding necessitates that information be exchanged among school boards and the Branch, possibly at frequent intervals, but generally during defined steps in the applications' processes. The approval and allocation of provincial capital support for school buildings has required that monitoring mechanisms be established to ensure responsible stewardship. The School Buildings Board is a decision-making body which is vested with the responsibility for school capital approvals and allocations. Information exchanges in the broadest sense between the Branch and other groups also can be expected.

A Review of Branch Operations

The purpose of the Branch is:

(a) to assist school boards as autonomous corporate bodies to plan, build, operate and maintain school buildings in order to facilitate the desired school program;

(b) to enable school boards to access government support for educational facilities in accordance with the provisions of The Alberta Act, The Department of Education Act, The School Act, The School Buildings Act, and other relevant statutes, and regulations, policies and guidelines pursuant thereto;

(c) to provide a planning and information capability for the purpose of assisting departmental and local authorities in planning for the provision and utilization of school facilities.

To fulfil this purpose, the mission of the Branch includes five Key Responsibility Areas (KRA's). The first two are important in terms of information needs. They are:

KRA 1

(i) To develop, implement and evaluate programs designed to assist school boards to plan, build, operate, and maintain school buildings in accordance with appropriate statutes and regulations of the Government of Alberta.

(ii) To establish a capability for processing all school board applications relative to school facilities in accordance with the laws and regulations of the Government of Alberta as they pertain to school facilities (i.e. The Alberta Act, The School Act, The Department of Education Act, and The School Buildings Act).

(iii) To convene regularly the School Buildings Board for the purpose of deciding upon applications made by school boards to add to, and to alter their inventory of school space.

KRA 2

To establish a planning capability for the purpose of:

a) assisting local authorities in the planning for providing, and utilizing school facilities;

b) facilitating the administration of laws and regulations pertaining to school facilities. (Where school boards lack the capabilities for completing all aspects of the planning required to provide and maintain school facilities, the Branch provides assistance and at the same time ensures that statutes and regulations are adhered to.)

KRA 3

To establish capabilities for:

a) maintaining effective and efficient practices and procedures in the Branch;

b) effectively interfacing with the needs, programs and services of other government departments or agencies.

KRA 4

To foster professional development and advancement of personnel of the Branch.

KRA 5

To develop and maintain a capability for effectively responding to emergent needs and special assignments.

The relation of staffing positions and KRA's is displayed in Table 1. Only the major areas of responsibility are shown and it is quite likely that greater participation in all KRA's would be shown by both Associate Directors if the minor areas of responsibility were shown. Automation most likely would assist all KRA's with the exception of KRA 4.

Organization of the School Buildings Services Branch

Principal members of the Branch are the Director and two Associate Directors, as shown in Figure 1. Two broad service areas are:

a) **Administrative Services**, whereby members of the Branch deal with programs that provide financial support for school buildings, specifically new construction and restoration;

b) **Policy, Planning and Technical Services**, whereby members of the Branch provide expertise to local boards regarding matters of facility planning, energy conservation and school building modernization, as well as providing for the Branch's input into public policy as it affects the operations of the Branch and Department.

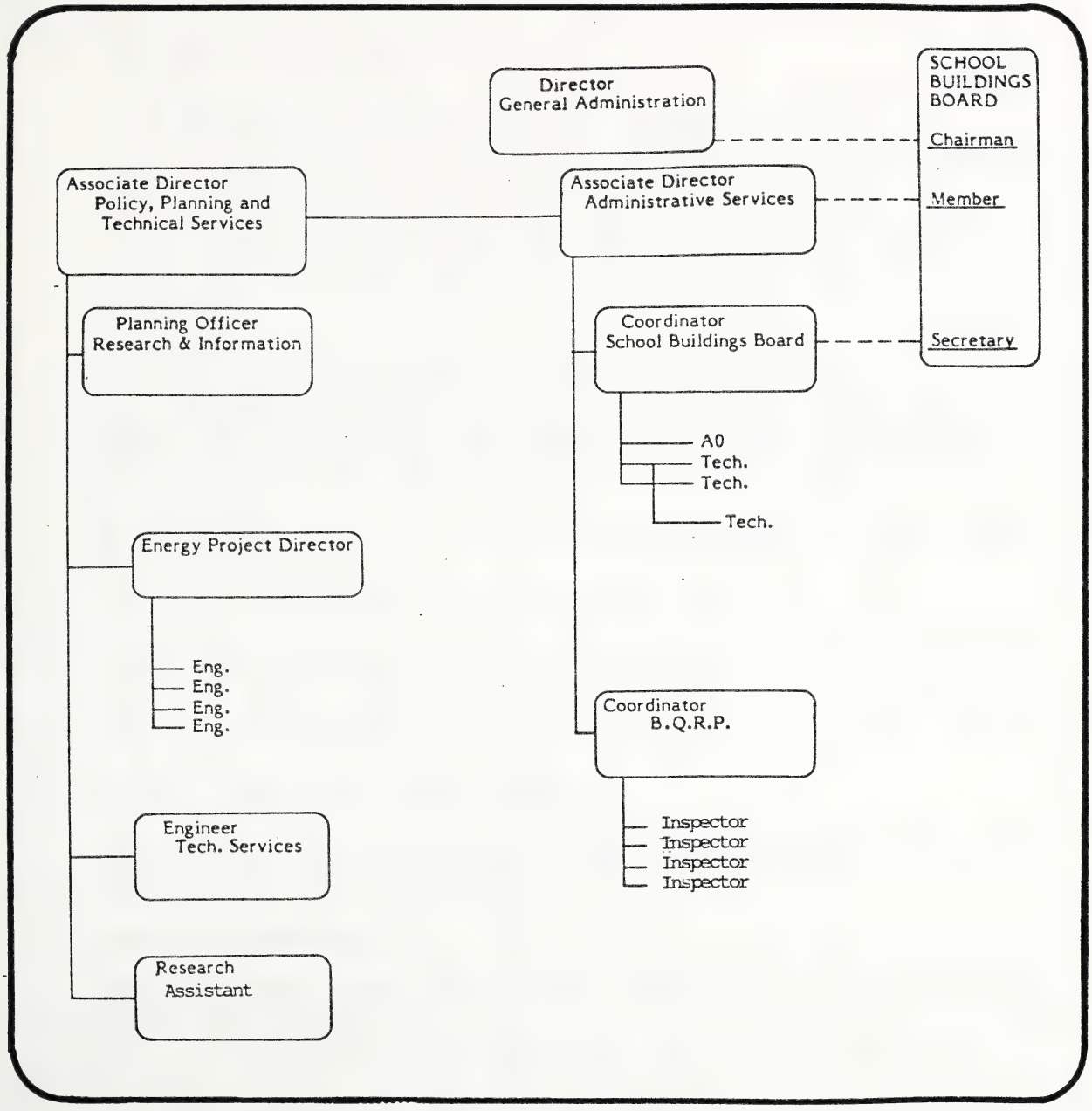
TABLE 1

LINKAGES AMONG POSITIONS IN THE SCHOOL BUILDING SERVICES BRANCH AND KEY RESPONSIBILITY AREAS

Group & Position	KRA 1	KRA 2	KRA 3	KRA 4	KRA 5
Director	x	x	x	x	x
Assoc. Dir Policy, Plg. and Tech'l	x	x		x	
Planning Officer	x	x	x		x
Energy Proj. Dir	x	x		x	
Energy Engineers		x			
Engineer Tech. Serv.	x	x			
Researcher	x	x	x		x
Assoc. Dir Admin. Serv.	x			x	x
Co-Ordinator Sch.Bldgs.Bd	x	x	x		
Admin. Off'r	x	x	x		x
Senior Tech	x	x	x		x
Senior Tech	x	x	x		x
Draft Tech	x	x			
Co-Ordinator B.Q.R.P.	x	x			
Construction Inspectors	x	x			

FIGURE 1

SCHOOL BUILDING SERVICES BRANCH ORGANIZATIONAL CHART



The Administrative Services Group

This group consists of an Associate Director, two co-ordinators (the Secretary of the School Buildings Board, and the Co-ordinator of the Building Quality Restoration Program) and a total of eight subordinates. The Secretary of the School Buildings Board is administratively responsible for the New Construction program. Four positions are subordinate to this co-ordinator and include one administrative officer, two senior technologists and one drafting technologist. Details of responsibilities and activities of each position are included in Appendix A.

The other co-ordinator is in charge of the Building Quality Restoration Program (BQRP). Four building inspectors report to this co-ordinator. The inspectors administer the small scale modernization projects (not exceeding $100,000), inspections of buildings under the BQRP Regulations and final inspections of school construction projects.

Five support staff, e.g. secretarial and word processing, report within this group.

The Policy, Planning and Technical Services Group

This group consists of an Associate Director, a Planning Officer, an Energy Project Director, an Engineer responsible for technical services, and a research assistant. Three field engineers report to the Energy Project Director. Additionally four support staff, e.g. secretarial, report within this group.

Physical Environment of the Branch

The location and linkages among personnel of the Branch are noted in Figure 2. The Branch occupies the western half of the ninth floor of the Devonian Building.

Existing Automation

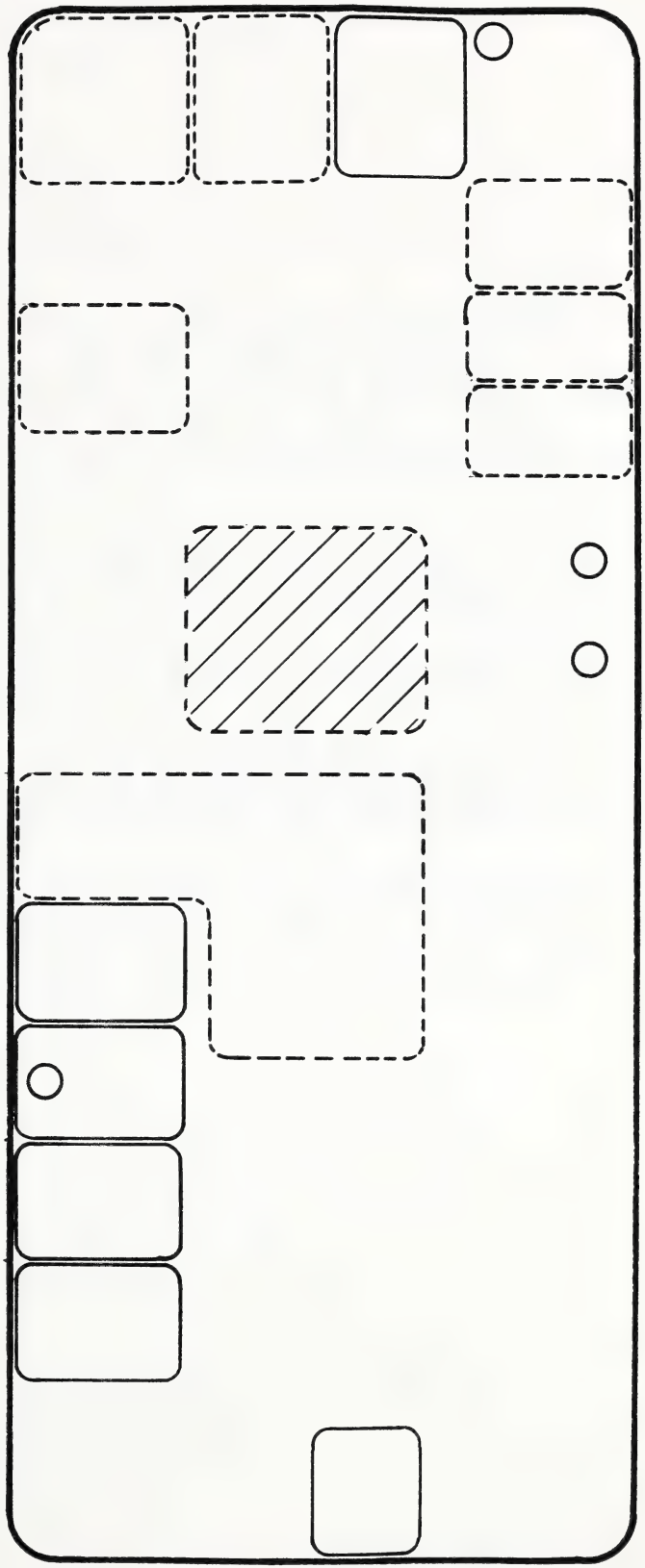
Three different types of automated systems support the activities of the Branch. They are:

(i) two Xerox 860 word processing units;

(ii) an IBM 3270 PC recently acquired to arrange databases and provide statistical functions, as well as connect to EDIS;

FIGURE 2

LOCATION OF MAJOR FUNCTIONS WITHIN THE SCHOOL BUILDING SERVICES BRANCH



SERVICES

- POLICY, PLANNING AND TECHNICAL SERVICES
- ADMINISTRATIVE SERVICES

TECHNICAL SUPPORT

- WORD PROCESSING EQUIPMENT (LINKED TO PRINTER)
- MICRO COMPUTERS (INDEPENDENT)

(iii) Apple microcomputers (two IIe's, one of which is borrowed from another Branch, one II plus that is available to the energy consultant who is located in Edmonton Regional Office of Education, and one IIc) that have been used mainly for energy conservation calculations and enrolment projections, and their software has been used extensively for database, spreadsheet and word processing functions during research assignments;

(iv) electronic typewriters that have been used for daily typing and one of which is of suitable configuration to provide letter quality printing for the Apple microcomputers;

(v) a large mainframe computer located in the Terrace Building, remote and not connected to the Branch. The mainframe houses the EDIS database.

The word processing units are relied on heavily for correspondence regarding the outcome of applications to the various supporting programs administered by the Branch, planning and research projects, and action requests.

Initial observation indicates that there is a physical separation among some group leaders and subordinates. The existing spatial arrangement of personnel may not be optimal. The most unfortunate outcome of this approach to automation is that none of the various types of business equipment can exchange their contents in memory.

SECTION 3

PROCESSES AND FLOWS

As a means to explore qualitatively what data and information flow into, within, and from the Branch three steps have been taken.

First, the exercise explored what activities are present at each node of the Branch. An example would be the activities associated with a request for funds through a specific program administered by the Branch.

Second, the locations of storage of data/information were noted. Additionally, note was made of the medium, e.g. standard size paper, diskette, and EDP output that was used to store or convey data/information.

Third, the exercise noted what data and information flow to, from, and within the nodes of the Branch as they pertain to the accomplishment of activities that are associated with all of the KRA's with the exception of KRA 4, which was believed to not generate many activities that would be assisted by automation.

The third step included a review of what happens at each node of activity in terms of the other ingredients of the acronym GRATIS, and noted what flows occurred.

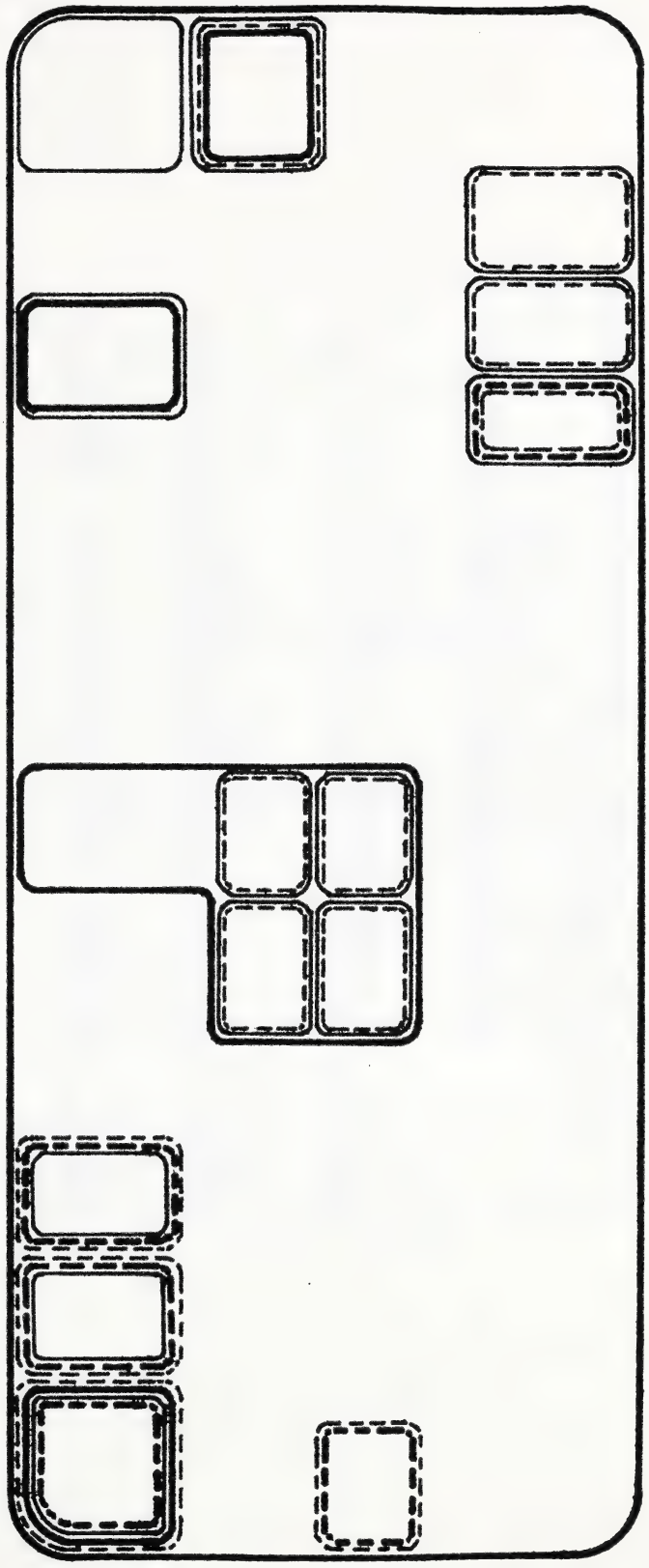
General Processes of Capital Programs

Three functions that are associated with KRA 1(ii) are the capital programs for school buildings which are: (i) new construction; (ii) modernization; and (iii) Building Quality Restoration program. School disposal evaluation is a fourth function of the Branch which is not associated with a specific capital program. The locations of personnel who participate in each function are displayed in Figure 3. It is evident that one individual, such as the administrative officer, or the director have input into more than one function.

New Construction

Assuming that an application is not rejected by the School Buildings Board, twenty-nine steps have been identified with the approval and allocation of funds for new construction, as displayed in Figure 4. The process is initiated by the receipt of

FIGURE 3
NODES OF ACTIVITY FOR CAPITAL PROGRAMS AND DISPOSALS.



LEGEND

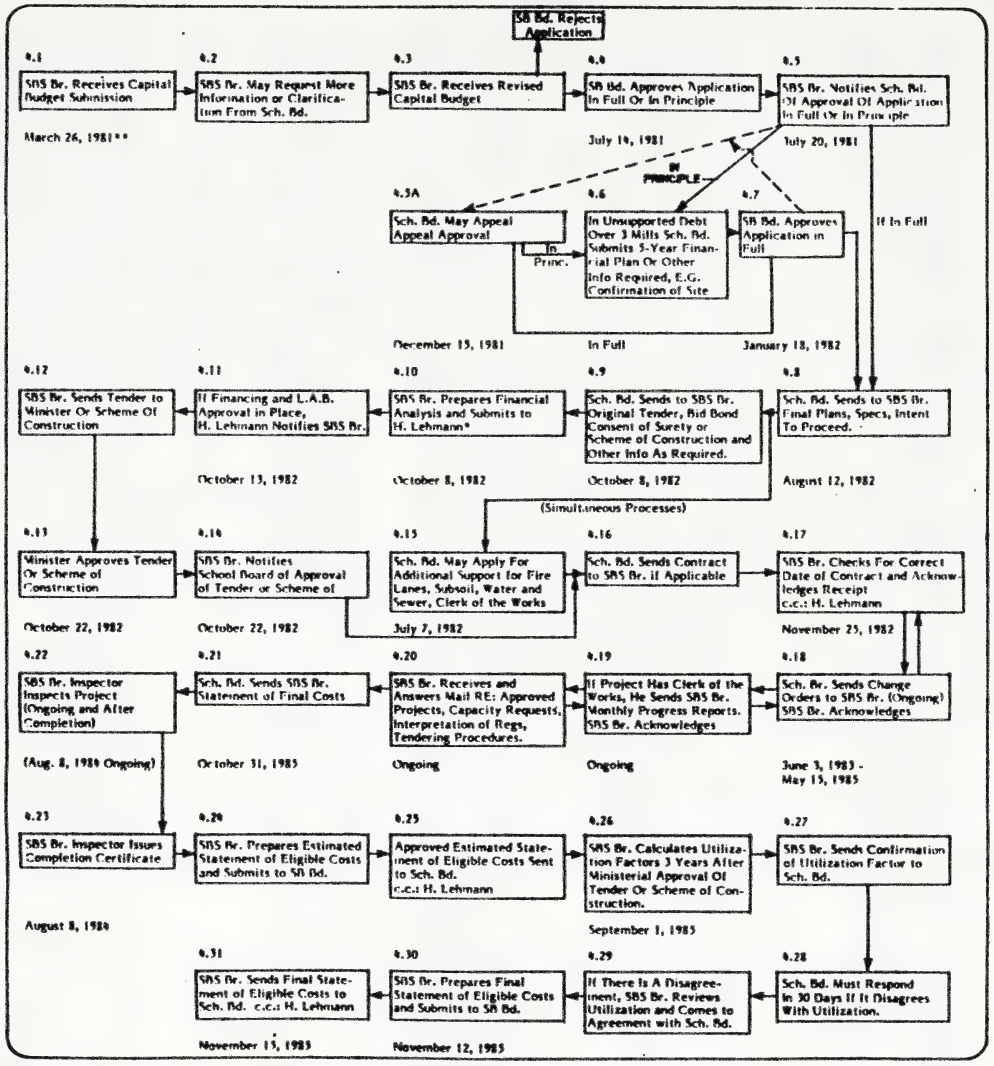
—— NEW CONSTRUCTION

- - - - MODERNIZATION

– – – DISPOSALS

—— BQRP

FIGURE 4 EXAMPLE OF DURATION OF NEW CONSTRUCTION PROJECT


SB Bd. Rejects Application
0.1
SBS Br. Receives Capital Budget Submission
March 26, 1981**
0.2
SBS Br. May Request More Information or Clarification From Sch. Bd.
0.3
SBS Br. Receives Revised Capital Budget
0.4
SB Bd. Approves Application In Full Or In Principle
July 14, 1981
0.5
SBS Br. Notifies Sch. Bd. Of Approval Of Application In Full Or In Principle
July 20, 1981
IN PRINCIPLE
If In Full
0.5A
Sch. Bd. May Appeal Appeal Approval
In Princ.
0.6
If Unsupported Debt Over 3 Mills Sch. Bd. Submits 5-Year Financial Plan Or Other Info Required, E.G. Confirmation of Site
0.7
SB Bd. Approves Application in Full
December 15, 1981
In Full
January 18, 1982
0.12
SBS Br. Sends Tender to Minister Or Scheme Of Construction
0.11
If Financing and L.A.B. Approval in Place, H. Lehmann Notifies SBS Br.
October 13, 1982
0.10
SBS Br. Prepares Financial Analysis and Submits to H. Lehmann*
October 8, 1982
0.9
Sch. Bd. Sends to SBS Br. Original Tender, Bid Bond Consent of Surety or Scheme of Construction and Other Info As Required.
October 8, 1982
0.8
Sch. Bd. Sends to SBS Br. Final Plans, Specs, Intent To Proceed.
August 12, 1982
(Simultaneous Processes)
0.13
Minister Approves Tender Or Scheme of Construction
October 22, 1982
0.14
SBS Br. Notifies School Board of Approval of Tender or Scheme of
October 22, 1982
0.15
Sch. Bd. May Apply For Additional Support for Fire Lanes, Subsoil, Water and Sewer, Clerk of the Works
July 7, 1982
0.16
Sch. Bd. Sends Contract to SBS Br. if Applicable
0.17
SBS Br. Checks For Correct Date of Contract and Acknowledges Receipt c.c.: H. Lehmann
November 25, 1982
0.22
SBS Br. Inspector Inspects Project (Ongoing and After Completion)
(Aug. 8, 1984 Ongoing)
0.21
Sch. Bd. Sends SBS Br. Statement of Final Costs
October 31, 1985
0.20
SBS Br. Receives and Answers Mail RE: Approved Projects, Capacity Requests, Interpretation of Regs, Tendering Procedures.
Ongoing
0.19
If Project Has Clerk of the Works, He Sends SBS Br. Monthly Progress Reports. SBS Br. Acknowledges
Ongoing
0.18
Sch. Bd. Sends Change Orders to SBS Br. (Ongoing) SBS Br. Acknowledges
June 3, 1983 - May 15, 1985
0.23
SBS Br. Inspector Issues Completion Certificate
August 8, 1984
0.24
SBS Br. Prepares Estimated Statement of Eligible Costs and Submits to SB Bd.
0.25
Approved Estimated Statement of Eligible Costs Sent to Sch. Bd. c.c.: H. Lehmann
0.26
SBS Br. Calculates Utilization Factors 3 Years After Ministerial Approval Of Tender Or Scheme of Construction.
September 1, 1985
0.27
SBS Br. Sends Confirmation of Utilization Factor to Sch. Bd.
0.31
SBS Br. Sends Final Statement of Eligible Costs to Sch. Bd. c.c.: H. Lehmann
November 15, 1985
0.30
SBS Br. Prepares Final Statement of Eligible Costs and Submits to SB Bd.
November 12, 1985
0.29
If There Is A Disagreement, SBS Br. Reviews Utilization and Comes to Agreement with Sch. Bd.
0.28
Sch. Bd. Must Respond In 30 Days If It Disagrees With Utilization.

* School Business Administration Branch

** Timing of Project: Holy Trinity Sr. High (Edmonton R.C.S.S.D. No. 7) 1982

a capital budget submission by the School Buildings Services Branch.

Should the school board wish to appeal any decision of the School Buildings Board, there is an appeal procedure that adds to the number of steps in the process. Should the proposal receive approval in principle, an additional two steps are added to the process.

Modernization

Twenty-nine steps have been identified with the approval and allocation of funds for a modernization project, assuming that the application is not rejected by the School Buildings Board, as displayed in Figure 5. The process is initiated by the receipt of a capital budget submission by the School Buildings Services Branch. There is an appeal process that adds to the number of steps that an application can follow.

Should the maximum government support be less than or equal to $100,000, eleven of the steps that involve the tendering of the project and approvals associated with the scheme of construction are eliminated. The BQRP inspectors report on these smaller modernization projects.

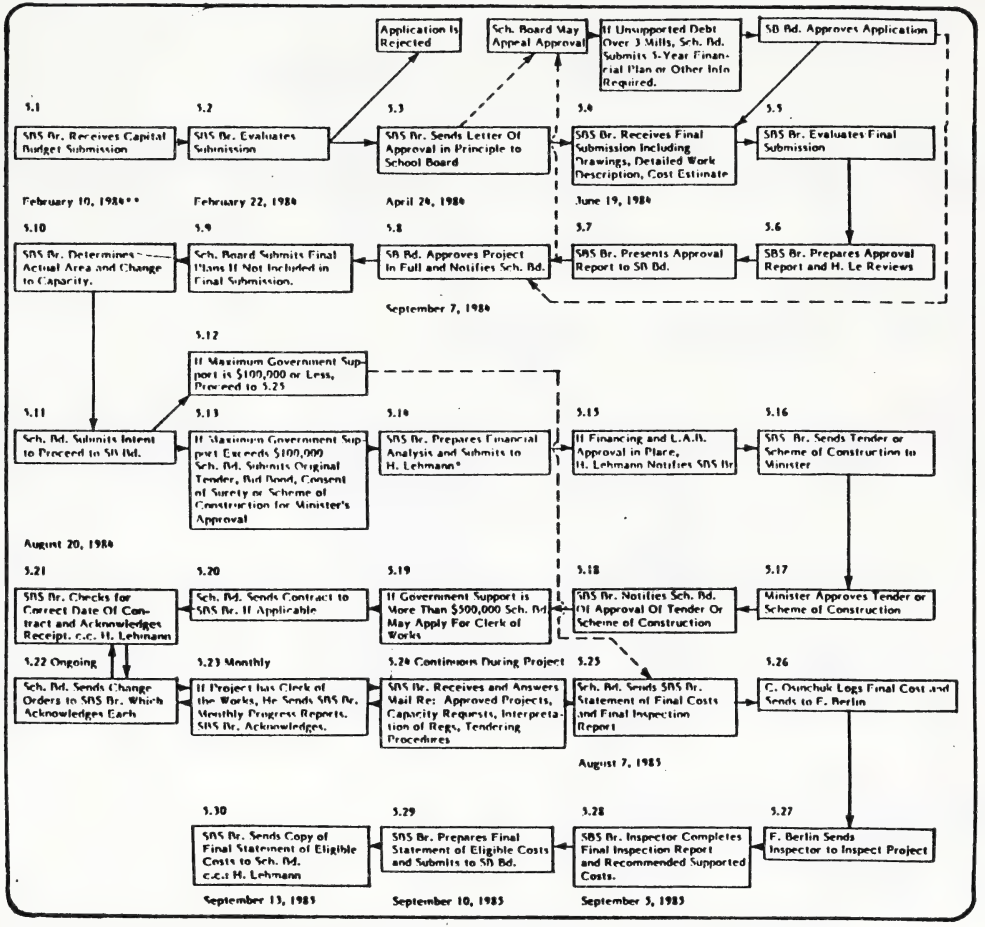
Depending upon the scale of the support of the project, correspondence and information flow to and from the School Building Services Branch on a regular or irregular basis, as noted in the latter steps of the process displayed in Figure 5.

Building Quality Restoration

Assuming that the application is not rejected, seventeen steps have been identified with the approval and allocation of funds for a building quality restoration project, as displayed in Figure 6. There are shortcuts within the process, such as applications under emergency conditions or for handicapped and energy conservation provisions, which reduce the standard process by three steps. Also should the maximum government support not exceed $100,000, an additional six steps are eliminated by passing the tendering component of the process.

Generally the process is initiated through receipt of applications and summary forms from the school boards prior to the end of the fiscal year (31 March) by the School Buildings Services Branch. The applications are for the following year of the program.

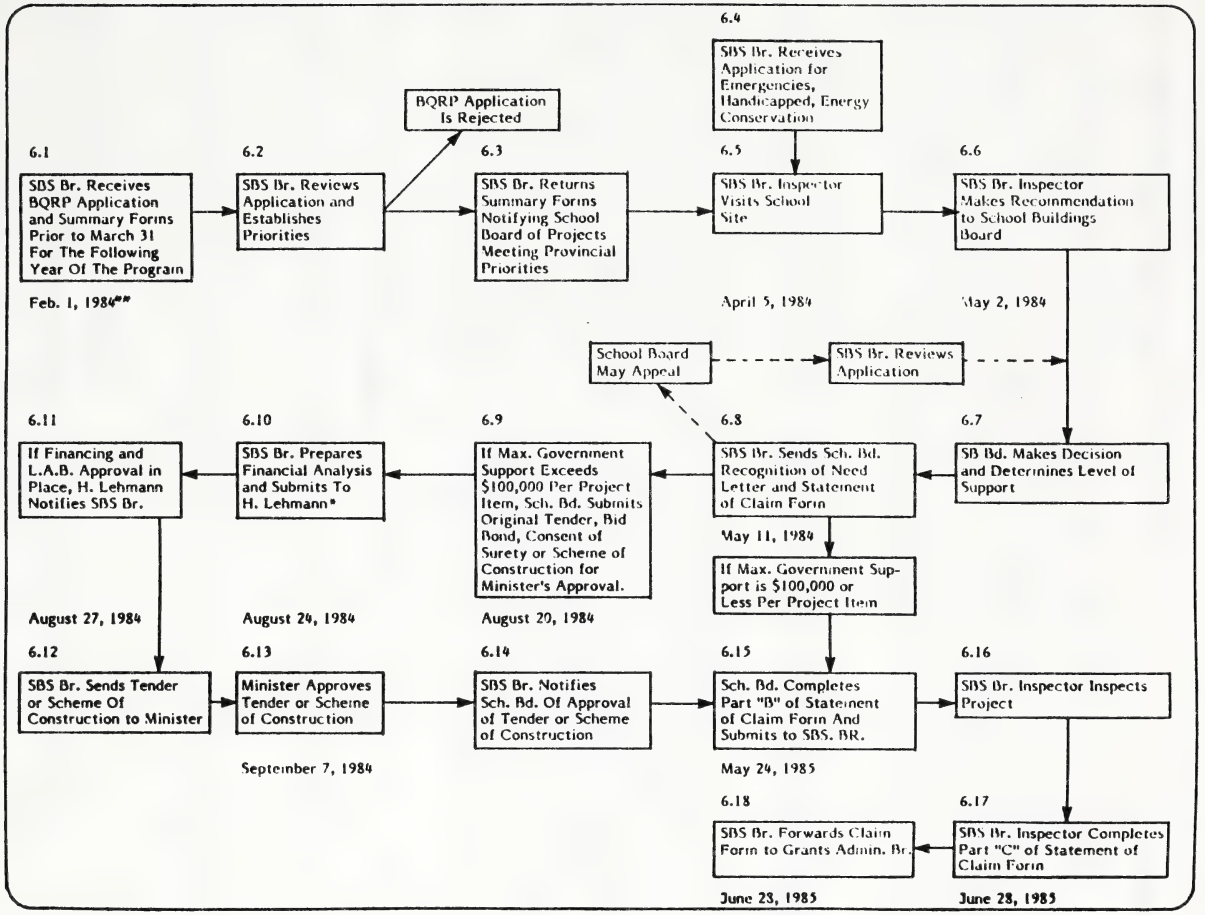
FIGURE 5 EXAMPLE OF PROCEDURES OF MODERNIZATION PROJECT


Application Is Rejected
Sch. Board May Appeal Approval
If Unsupported Debt Over 3 Mills, Sch. Bd. Submits 5-Year Financial Plan or Other Info Required.
SB Bd. Approves Application
5.1
SBS Br. Receives Capital Budget Submission
5.2
SBS Br. Evaluates Submission
5.3
SBS Br. Sends Letter Of Approval in Principle to School Board
5.4
SBS Br. Receives Final Submission Including Drawings, Detailed Work Description, Cost Estimate
5.5
SBS Br. Evaluates Final Submission
February 10, 1984**
February 22, 1984
April 20, 1984
June 19, 1984
5.10
SBS Br. Determines Actual Area and Change to Capacity.
5.9
Sch. Board Submits Final Plans If Not Included in Final Submission.
5.8
SB Bd. Approves Project in Full and Notifies Sch. Bd.
5.7
SBS Br. Presents Approval Report to SB Bd.
5.6
SBS Br. Prepares Approval Report and H. Le Reviews
September 7, 1984
5.12
If Maximum Government Support is $100,000 or Less, Proceed to 5.25
5.11
Sch. Bd. Submits Intent to Proceed to SB Bd.
5.13
If Maximum Government Support Exceeds $100,000 Sch. Bd. Submits Original Tender, Bid Bond, Consent of Surety or Scheme of Construction for Minister's Approval
5.14
SBS Br. Prepares Financial Analysis and Submits to H. Lehmann*
5.15
If Financing and L.A.B. Approval in Place, H. Lehmann Notifies SBS Br
5.16
SBS Br. Sends Tender or Scheme of Construction to Minister
August 20, 1984
5.21
SBS Br. Checks for Correct Date Of Contract and Acknowledges Receipt. c.c. H. Lehmann
5.20
Sch. Bd. Sends Contract to SBS Br. If Applicable
5.19
If Government Support is More Than $500,000 Sch. Bd May Apply For Clerk of Works
5.18
SBS Br. Notifies Sch. Bd. Of Approval Of Tender Or Scheme of Construction
5.17
Minister Approves Tender or Scheme of Construction
5.22 Ongoing
Sch. Bd. Sends Change Orders to SBS Br. Which Acknowledges Each
5.23 Monthly
If Project has Clerk of the Works, He Sends SBS Br. Monthly Progress Reports. SBS Br. Acknowledges.
5.24 Continuous During Project
SBS Br. Receives and Answers Mail Re: Approved Projects, Capacity Requests, Interpretation of Regs, Tendering Procedures
5.25
Sch. Bd. Sends SBS Br. Statement of Final Costs and Final Inspection Report
5.26
C. Osinchuk Logs Final Cost and Sends to F. Berlin
August 7, 1985
5.30
SBS Br. Sends Copy of Final Statement of Eligible Costs to Sch. Bd. c.c. H. Lehmann
5.29
SBS Br. Prepares Final Statement of Eligible Costs and Submits to SB Bd.
5.28
SBS Br. Inspector Completes Final Inspection Report and Recommended Supported Costs.
5.27
F. Berlin Sends Inspector to Inspect Project
September 13, 1985
September 10, 1985
September 5, 1985

* School Business Administration Branch

** Timing of Project: Hillside School Modern. (East Smoky Division No. 54) 1984

FIGURE 6 EXAMPLE OF DURATION OF B.Q.R.P. PROJECT


6.1
SBS Br. Receives BQRP Application and Summary Forms Prior to March 31 For The Following Year Of The Program
Feb. 1, 1984**
6.2
SBS Br. Reviews Application and Establishes Priorities
BQRP Application Is Rejected
6.3
SBS Br. Returns Summary Forms Notifying School Board of Projects Meeting Provincial Priorities
6.4
SBS Br. Receives Application for Emergencies, Handicapped, Energy Conservation
6.5
SBS Br. Inspector Visits School Site
April 5, 1984
6.6
SBS Br. Inspector Makes Recommendation to School Buildings Board
May 2, 1984
School Board May Appeal
SBS Br. Reviews Application
6.7
SB Bd. Makes Decision and Determines Level of Support
6.8
SBS Br. Sends Sch. Bd. Recognition of Need Letter and Statement of Claim Form
May 11, 1984
6.9
If Max. Government Support Exceeds $100,000 Per Project Item, Sch. Bd. Submits Original Tender, Bid Bond, Consent of Surety or Scheme of Construction for Minister's Approval.
August 20, 1984
6.10
SBS Br. Prepares Financial Analysis and Submits To H. Lehmann*
August 24, 1984
6.11
If Financing and L.A.B. Approval in Place, H. Lehmann Notifies SBS Br.
August 27, 1984
If Max. Government Support is $100,000 or Less Per Project Item
6.12
SBS Br. Sends Tender or Scheme Of Construction to Minister
6.13
Minister Approves Tender or Scheme of Construction
September 7, 1984
6.14
SBS Br. Notifies Sch. Bd. Of Approval of Tender or Scheme of Construction
6.15
Sch. Bd. Completes Part "B" of Statement of Claim Form And Submits to SBS. BR.
May 24, 1985
6.16
SBS Br. Inspector Inspects Project
6.17
SBS Br. Inspector Completes Part "C" of Statement of Claim Form
June 28, 1985
6.18
SBS Br. Forwards Claim Form to Grants Admin. Br.
June 23, 1985

* School Business Administration Branch
** Timing of Project: Olds Elementary (County of Mountainview No. 17) 1984

Summary Regarding Processes Associated with Capital Programs

Each capital program necessitates considerable work by the members of the Branch which can span a great deal of time. Sample durations of each type of capital program have been superimposed upon Figures 4, 5, and 6. Generally, members of the Branch believe that an average duration for a new construction project is about two years rather than the five years illustrated. Although extreme, the example used involved litigation, and does indicate that files, hence data/information must remain 'active' for five years.

These examples serve to illustrate the extent of the paper work and the duration of each file that is required to support each project per school.

Another important consideration regarding automation, specifically the nature of tabulations, is the impact of decision-making upon the parameters of description and comparison, e.g. floor areas, enrolment, utilization, the status of debentures, and others. Each change to one component of a particular school alters all other parameters of the school, the school jurisdiction, and the province. Alterations to the basic parameters of description and comparison will not just affect decision-making in an on-going fashion but will play a role in future decisions as supportive budgets are arranged for each program at the beginning of the fiscal cycle.

Another Information Generator - The Disposal Process

Four steps have been identified with the general process associated with a school building disposal and are displayed in Figure 7.

Generally the process is initiated through receipt of a request from a school board by the School Buildings Services Branch.

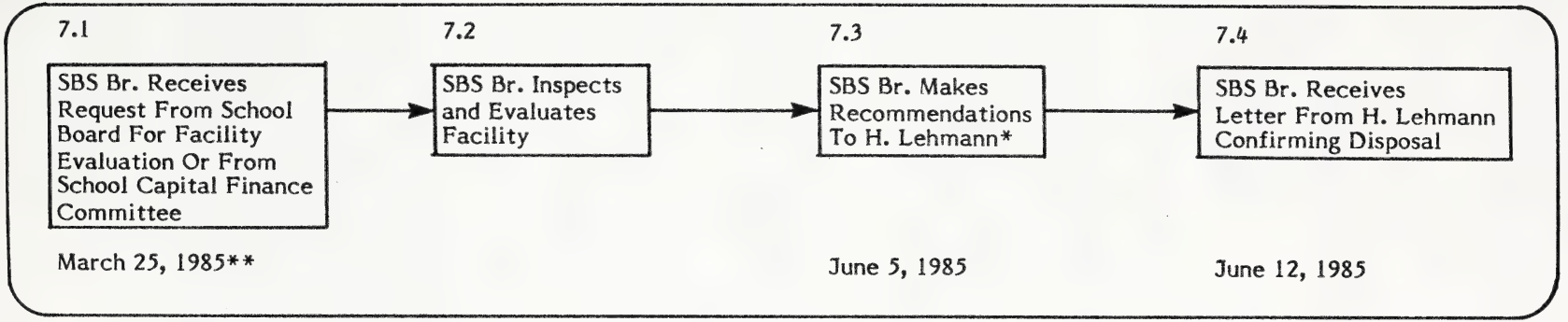
Data and Information Flows

Locations of Data/Information Storage within the Branch

Ten general categories of data/information were considered in this exercise. The were:

a) School Buildings Board Minutes;
b) Building Quality Restoration Program files;
c) Modernization files;

FIGURE 7 EXAMPLE OF DURATION OF DISPOSAL PROJECT


7.1
SBS Br. Receives Request From School Board For Facility Evaluation Or From School Capital Finance Committee
March 25, 1985**
7.2
SBS Br. Inspects and Evaluates Facility
7.3
SBS Br. Makes Recommendations To H. Lehmann*
June 5, 1985
7.4
SBS Br. Receives Letter From H. Lehmann Confirming Disposal
June 12, 1985

* School Business Administration Branch
** Timing of Project: Foremost School (County of Forty Mile No. 8)

d) Disposals files;
e) ECS Grants Approval files;
f) New Construction files;
g) Energy Conservation files;
h) Floor Plans files;
i) General Administration files;
j) Miscellaneous Information files.

The estimated volume of hard copy paper files is about 370-420 cubic feet. This estimate does not include the data/information that are stored elsewhere in the building in Central Records. In fact, eighty-seven different areas within the Branch are used for storing data/information pertinent to the ten categories mentioned above. The spatial distribution of the locations is displayed in Figure 8. Duplications of information have been observed, although some are related to variations in assembly of the data/information.

Energy conservation data, administration files and accounts are stored on 5.25 inch diameter diskettes used in the Apple micro computers. Monitoring of the Capital Projects in 1986, and Modernization projects of 1984 and 1985 occurs with the aid of a `database' program on the Apple IIe microcomputer.

Additionally, during the course of the research of this report, pilot projects were established successfully, using the microcomputers to store and manipulate the following information by school jurisdiction: operating capacity; total enrolment; utilization; utilization factors; equity factors; the product of the utilization and equity factors. The results of one tabulation are listed in Appendix I. The equivalent records, in more detail but never-the-less manually prepared, are noted in Appendix H.

Long term (50 years) storage of information about school buildings is a requirement for the Branch in order to maintain effective operations. The resulting large volume of paper whose contents involve school capital projects is a major concern of management, both in terms of storage and more importantly ~in terms of information management. A strategic opportunity not to be lost is the transformation of these data/information stores into an automated School Buildings Data Base. A desirable outcome is a complete profile about each of the 1500 schools throughout the province. It is envisaged that this will result in an increase in efficiency by which the Branch conducts its business.

FIGURE 8

LOCATIONS OF DATA/INFORMATION STORAGE WITHIN THE SCHOOL BUILDING SERVICES BRANCH

LEGEND

SCHOOL BUILDINGS BOARD MINUTES

1. All Minutes
2. New Construction Minutes: a) All
   b) By Jurisdiction
3. BQRP Minutes: a) All
   b) By Jurisdiction
4. BQRP Agendas

BUILDING QUALITY RESTORATION PROGRAM

1. Main Files (1979 - Current)
2. Historic Files (pre-1979)
3. EDIS Information
4. Facility Evaluation Reports
5. Approval Letters
6. Utilization Information*
7. (A,B,C,D) Building Inspection (Current) Files
8. Tender Logs
9. Architectural Plan Logs
10. Claims Forms
11. Log Sheets
12. Cost Summaries
13. 1986 Inspectors' Files
14. Historical Inspection Files
15. Building Conditions Surveys
16. Time Log of Tenders
17. Cost Factors
18. Fund Control Factors
19. Summary Log of Applications
20. Recognition of Need Summaries
21. Tender Approval Letters (>$100,000)
22. Equity Factors

MODERNIZATION

1. Main Files (All Years)
2. Facility Evaluation Reports
3. Inspection Files
4. EDIS Information
5. Capital Plan Reports
6. 'Form A' Information
7. Utilization Information*
8. Tender Log
9. Clerk of the Works Log
10. Facility Analysis Forms
11. Architectural Plan Logs
12. School Opening Files
13. Building Conditions Survey
14. Capital Budget Submission Log
15. Time Log of Tenders
16. Photographs (A,B,C)
17. Tender Approval Letters
18. Equity Factors
19. Summary of Projects Tendered
20. Capital Budget Monthly Summary

DISPOSALS

1. Files (All Years)
2. Evaluations/Related Technical Files
3. Disposal Letters (A, B, C)
4. Inspectors' Reports
5. Building Conditions Survey

ECS GRANTS APPROVALS

1. Approval Letters
2. Inspectors' ECS Private School Files

NEW CONSTRUCTION

1. Main Files (All Years)
2. Capital Plan Reports
3. 'Form A'
4. EDIS Information
5. Utilization Information*
6. Misc. Information
7. Tender and Day Labour Logs
8. 3-Year Adjustment Log
9. Clerk of the Works Log
10. Facility Analysis Forms
11. Architectural Plan Logs
12. School Opening Files
13. Facility Evaluation Reports
14. Inspection Files
15. Report Forms
16. Inspectors' Correspondence
17. Capital Budget Submission Log
18. Time Log of Tenders
19. Tender Approval Letters
20. Equity Factors
21. Summary of Projects Tendered
22. Capital Budget Monthly Summary

ENERGY CONSERVATION

1. Main Files (All Years)
2. Related Information Files
3. Working Files
4. Energy Accounting Records

FLOOR PLANS

1. Blueprints of Floor Plans and Data Boxes
2. Original Drawings
3. Reductions of Floor Plans and Data Boxes
4. Final Plans and Specifications New Construction and Modernization

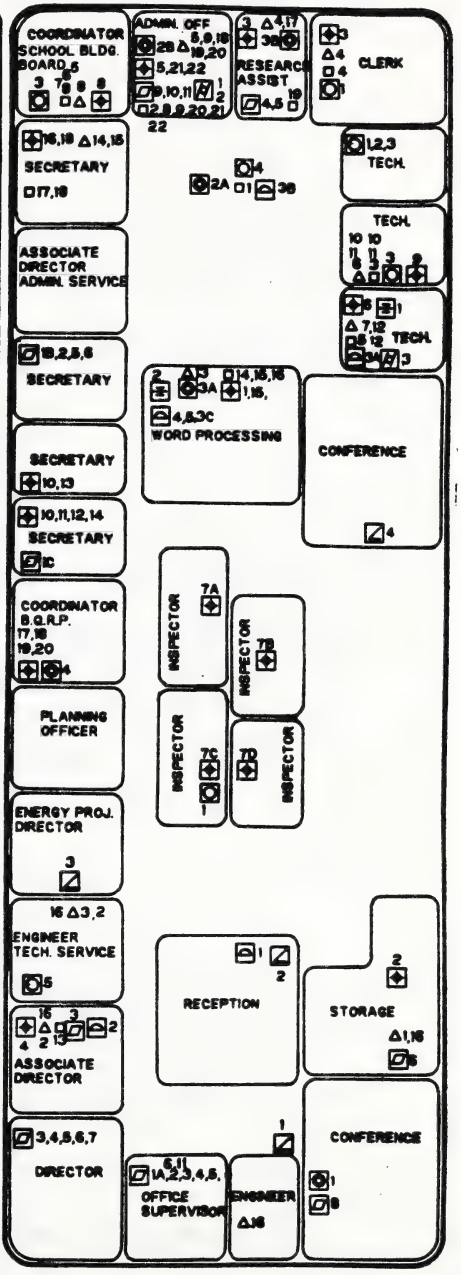
GENERAL ADMINISTRATION

1. Personnel: a) General
   b) Admin Services
   c) BQRP
2. Accounts Payable Files
3. School Acts and Regulations
4. CEFPI Files
5. CEFP AB Chapter Files
6. Department/Division/ Inter-Branch Files
7. Branch Files
8. Circulation Files
9. P.E.P. Applications
10. S.T.E.P. Applications
11. Budget Information of Branch

MISCELLANEOUS INFORMATION

1. Annual Reports
2. Fire Warden Information
3. Field Package Files

* Enrolments and Capacities



Flows

Each member of the Branch who was considered to be a node and sub-node of activity was interviewed to determine the origins, destinations, and patterns of communication among members both internally and externally to the Branch.

The acronym GRATIS assisted in the description of what activities occurred at each node and sub-node within the Branch and how they influenced the state of data and information.

a) Generation of data by staff of the Branch.

Field inspections provide school-based data. Examples are preliminary and final inspections by the BQRP inspectors, and other staff who may compile facility evaluations of schools and facility development plans. These reports can deal with, for example, one school or a school jurisdiction and can be for the purpose of energy management, planning, modernization, and disposal. The types of information acquired from the reports of the building inspectors is displayed in Appendix B and types of data/information included in facility evaluation reports are noted in Appendix C. Data acquired for the purpose of energy management are noted in Appendix J.

b) Retrieval of data/information from a secondary storage source.

Information is retrieved from a variety of sources: (i) an assortment of dispersed hard copy files retained within the Branch; and (ii) from Computer Services located on a separate floor elsewhere in the building who maintains the EDIS database. The types of outputs from the EDIS database are noted in Appendix D; (iii) tender related documents from the Records Centre; (iv) old school capital project files from Central Records, the Record Centre, and Government Archives.

c) Acquisition of data from sources inside/outside the Branch

Data are acquired through a variety of sources internal and external to the Branch and include: (i) the application forms prepared by the school boards for various programs, (e.g.) Form A for new construction, Form B for modernization, and the BQRP forms. Samples of the forms are retained in Appendix E; (ii) appraisers reports regarding the worth of a school building ready for disposal; (iii) annual reports and financial statements prepared by the school boards; (iv) energy consumption statements

provided by the school boards; (v) historical enrolments from the School Business Administration Branch as shown in Appendix M; and (vi) current enrolments as noted in Appendix G.

d) Transformations of data into useful information are generally tabulations, that is accumulations. An example is the Capital Plan Report that is prepared bimonthly by the Administrative Office of the Administrative Services section of the Branch. Tender logs and records of final plans are also retained. Information and summaries which represent the contents of a capital plan report, tender logs, and records of final plans are noted in Appendix F.

e) Informing other members of the Branch and some personnel external to the Branch is done through print. Examples are the Capital Plan Report, and tabulated information, (e.g.) enrolments and floor space, prepared by the technicians of the Administrative Services section of the Branch. Other sources of informing are the Annual Report, of which relevant extracts are noted in Appendix K, Fire Warden Information as noted in Appendix L , and `Field Packages' as noted in Appendix M.

f) Storage of data and information has already been discussed above.

Interviews were conducted with all members of the Branch excluding the support staff. The purpose of the interviews was to determine flows and what data/information activities occurred at each node or sub-node of the network that represented the Branch. Lines of communication were plotted as a means to determine who were users and who were transmitters of data/information within the Branch. The exercise sought to determine whether the Branch functioned in a manner that would be typical of any organization, i.e. upward inputs feeding into senior positions, as well as the School Buildings Board, and whether there were various ways in which communicating occurred internally and externally.

Generally, the senior positions in the hierarchy could be described as `users', that is, they absorbed more inputs than they transmitted. The inverse was the case for positions at the lower stratum of the hierarchy.

By dissecting the inputs and outputs into three categories: a) intra-Branch; b) Branch/internal to the Department; c) Branch/external to the Department, a different pattern emerged, illustrated by the figures in Appendix O.

The Director absorbs intra-Branch inputs of transmitted information in greater amounts than he produces outputs to other members of the Branch. This changes to a balanced output to input when considering external sources and destinations of information.

Both Associate Directors tend to be users of both intra-Branch and external information.

Additionally, the technician responsible for enrolment, capacity and utilization information disseminates it to a variety of users within the Branch.

The position that has the largest number of inputs and outputs, that of the research assistant who tends to be a supplier of intra-Branch information and who tends to exchange inputs and outputs with external sources of data/information.

The number of inputs and outputs, both intra-Branch and extra-Branch are noted in Table 2.

Summary of Flows of Data/Information in the Branch

The acronym G.R.A.T.I.S. has been used to review what occurs to data as they enter the School Buildings Services Branch as well as to note what medium is used. It may be summarized in the following way:

Generation/Retrieval/Acquisition

Virtually all data/information generated by observation, retrieved from a secondary source of storage, or acquired from a primary source or distributing agent are retained on paper, and it may be a standard size, or blueprint.

Transformations

All transformations, with the exception of the enrolment projections and the energy conservation material are prepared manually or with the aid of small calculators. The enrolment projection program is rather primitive and is insufficient for rapid turnaround. The software available to support the energy conservation program appears to be more elaborate, offering tabulations and graphical output.

TABLE 2 INPUTS / OUTPUTS OF THE SCHOOL BUILDINGS SERVICES BRANCH

POSITION OF MEMBER OF BRANCH	INTRA-BRANCH FLOWS		INTRA-BRANCH/DEPT FLOWS		BRANCH/EXTRA DEPT FLOWS	
	Inputs	Outputs	Inputs	Outputs	Inputs	Outputs
Director	10	6	0	0	1	1
Associate Director / Policy Planning & Tech Services	12	6	1	0	2	2
Planning Officer	3	4	1	0	0	0
Energy Project Director	7	4	0	0	1	1
Energy Engineers	4	1	1	1	2	2
Engineer/ Technical Service	4	3	0	0	2	0
Research Assistant	9	15	5	4	3	4
Research Clerk	1	4	1	2	0	0
Associate Director / Administrative Services	9	3	1	2	1	2
Co-Ordinator / School Buildings Board	6	4	2	1	1	1
Administrative Officer	2	7	2	1	1	0
Plans Examiner A	3	10	1	0	1	1
Plans Examiner B	1	5	1	1	2	2
Project Draftsman	1	4	1	1	0	0
Co-Ordinator / B.Q.R.P.	3	6	0	2	1	0
Construction Inspectors	6	5	0	0	0	0

Interaction

All intra-Branch dissemination of information is via paper. A significant point to note is the high degree of dependence that is placed upon subordinates to convey important information

regarding transformed data, e.g. floor areas, capacities, utilization, debenture supply, et cetera.

Storage

The prominent medium of storage is paper. Energy conservation accounts' data are retained on 5.25 inch diskettes. A few items, such as this report and the pilot project of utilization factors, equity factors and their products are stored on 5.25 inch diskettes. Some correspondence is stored on larger discs associated with the Xerox 860 word processors.

SECTION 4

ANALOGUE OF THE BRANCH

The description of activities in the foregoing text which are undertaken at each node and sub-node of the Branch permits the opportunity to illustrate graphically Branch processes based upon the acronym GRATIS. The analogue form of the Branch is displayed in Figures 9 and 10. Intra-Branch communications are noted in Figure 9. External to Branch communications are noted in Figure 10. Each node, i.e. office within the Branch is considered independently from all others in Figures 9 and 10.

It is apparent that two elements of data/information flows toward which attention must be directed are:

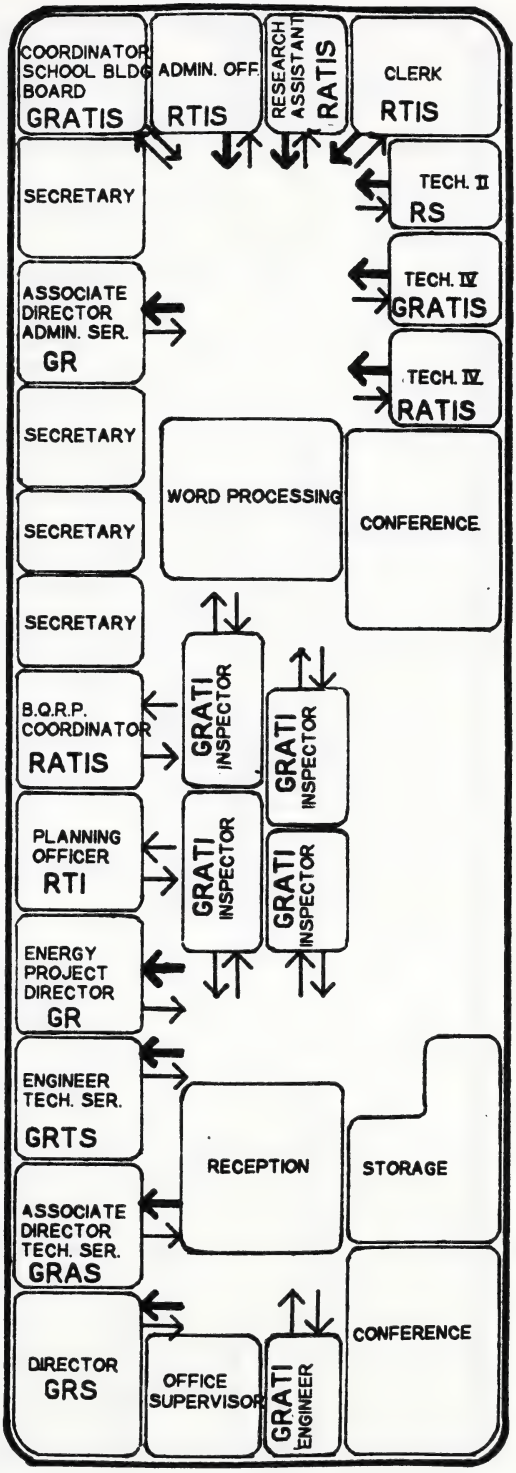
(i) transformation, where fifteen members of this staff are involved in transforming data into usable information, mainly for intra-Branch purposes;

(ii) storage, where sixteen members of the staff are involved in storing data/information.

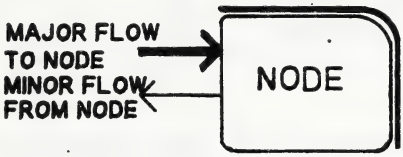
Interpretation of the figures must be made in the following manner: each office, that is, position in the Branch must be viewed independently from the others in each of the figures, i.e. a broad arrow originating from one of the positions cannot be compared with any other arrow originating from any other position.

FIGURE 9

ANALOGUE OF SCHOOL BUILDING SERVICES BRANCH -INTRA-BRANCH LINKS



GRATIS AND DATA/INFORMATION FLOWS



G - GENERATION OF PRIMARY DATA

R - RETRIEVAL OF DATA/INFO. FROM A SECONDARY SOURCE. (I.e. A STORAGE AREA)

A -ACQUISITION OF DATA/INFO. FROM A PRIMARY SOURCE (I.e. RECIPIENT OF DISTRIBUTING AGENT)

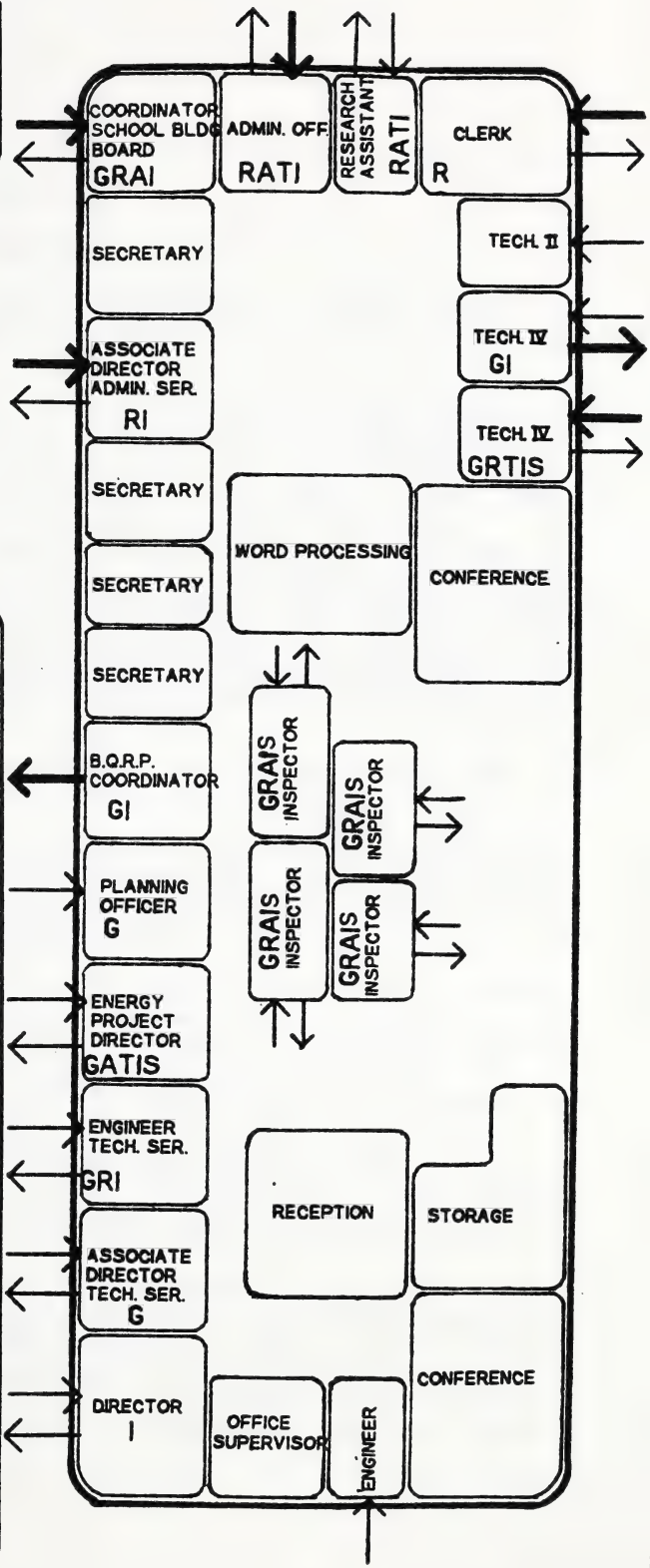
T - TRANSFORMATION OF DATA INTO USABLE INFORMATION

I - INTERACTION (I.e. COMMUNICATING/ DISSEMINATING)

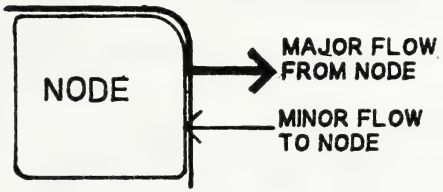
S - STORAGE OF DATA/INFO. ON AN APPROPRIATE MEDIUM.

FIGURE 10

ANALOGUE OF SCHOOL BUILDING SERVICES BRANCH -EXTERNAL LINKS



GRATIS AND DATA/INFORMATION FLOWS



G - GENERATION OF PRIMARY DATA

R - RETRIEVAL OF DATA/INFO. FROM A SECONDARY SOURCE. (I.e. A STORAGE AREA)

A -ACQUISITION OF DATA/INFO. FROM A PRIMARY SOURCE. (I.e. RECIPIENT OF DISTRIBUTING AGENT)

T - TRANSFORMATION OF DATA INTO USABLE INFORMATION.

I - INTERACTION (I.e. COMMUNICATING/ DISSEMINATING)

S - STORAGE OF DATA/INFO. ON AN APPROPRIATE MEDIUM

SECTION 5

OBSERVATIONS AND COMMENTS

The purpose of the report up to this point was to fact find, i.e. to be descriptive, and to identify what areas would be suited for a more detailed evaluation.

It appears that there are several activities within the School Buildings Services Branch which will benefit from automation. Also, further considerations must include the ever present need to increase efficiency at each node within the Branch. This can be accomplished by a variety of methods, such as reducing repetitive activities, for example the multiple entry of data, and assisting to make information more easily accessible through non-paper files. Greater sophistication can be introduced to the area of planning and development of public policy such as attending to concepts that permit comparative analyses. This may affect the nature of the databases to be developed, however it remains to be discussed .

For example, there are three areas that can be assisted. They are:

i) the approval of government support for capital improvements to school buildings and some equipment throughout the province. Both the planning and evaluation function, and the operations of the School Buildings Board will be affected;

ii) monitoring operational changes in school buildings throughout the province in order to distribute incrementally supportive resources for capital improvements to school buildings as well as program delivery components throughout the province. The monitoring will assist the gatekeepers of resources to assess allocations with respect to total budget and other matters related to financial matters, such as the capital plan information and program cycles. Also, monitoring will affect all programs and will be felt mainly in the routines associated with the modernization and building quality restoration programs.

iii) planning for greater efficiency and effectiveness in the Branch's procedures, guidelines, et cetera, including comparative evaluations and other mechanisms by which existing policy may be reconsidered, challenged, and amended if considered desirable to do so. This will have an impact on all programs and will benefit significantly the Policy, Planning and Technical Services section of the Branch.

Any move towards office automation should be conducted with the following goals in mind: a) changes must seek to increase efficiency in daily operations, and relieve tedium; and b) improved ratios of the time for the retrieval of information to the time for other research related activities. The latter can permit senior managers more time for activities such as internal and external communications, policy evaluation, the evaluation of program delivery, and responses to requests for assistance from upper echelons in the bureaucratic and political hierarchies, et cetera.

What is most evident is the necessity to maintain tabulated records of enrolments, floor areas, capacities, utilization, and capital expenditures. The pilot project aside, detailed records are maintained presently without the assistance of an automated system and in several examples, updates can be on a daily basis. These repetitive procedures can absorb up to one-third of a person-day every day at peak times. Some 'permanent' records are maintained in pencil for ease of alteration.

Any strength of the existing system, (i.e.) the operations currently maintained by the Branch is the fact that a variety of data and information are available, subject to certain limitations, such as accessibility and timeliness. Turnaround time from EDIS for a repetitive output is about 24 hours. Other outputs are perceived to require up to three to four months, causing some reluctance on the part of the staff members to be adventuresome with the use of the EDIS data base.

Weaknesses are evident in the current system, particularly with respect to certain administrative and planning procedures. Examples include:

a) the physical dispersal of the storage areas;
b) the slow turnaround time of the EDIS database and its inherent limitations through its creation from past EDP objectives;
c) paper storage of school-based and board-based data and information;
d) the lack of formulations for planning purposes, (i.e.) there are not any evident statements that have been made to perform comparative analysis, and to integrate data/information as techniques to assist planning;
e) the lack of formulations to suit requests for support/service from the senior bureaucratic and political levels of the Department;
f) the significant amount of time required to maintain and update records, as well as to access information;

g) the lack of attention to preparing a secure storage medium for important records;
h) the lack of standardized recording of school-based facility evaluations' data;
i) the apparent need to retrieve historic information stored in a remote location to the Branch, i.e. in Central Records;
j) the lack of communication between existing business equipment in the Branch.

Other difficulties imposed by the existing system are:

i) the physical size of the storage system geared to maintain paper records;
ii) hazards associated with paper records, e.g. fire, excessive weight on the floors;
iii) poor access to School Building Board minutes that are retained in the conference room of the Branch (although during the course of this research microfilming of historic records commenced).

Another observation involves the general processes regarding applications for funds from the new construction, modernization and restoration programs. The processes are so elaborate that often applications are carried out in an order that is different to that which is depicted due to the following factors:

a) lack of familiarity with procedures by some school boards;
b) attitudes of some boards with respect to the procedures;
c) small projects that involve little support from the province.

Further the timing of each project appears to be variable and certain activities within the processes appear within a range of activities implying variability in the order of the activities.

Clearly there is ample opportunity to encourage automation in several activities throughout the Branch. Mundane chores could be alleviated, allowing the staff member to undertake other activities. Additionally, there is another opportunity worth pursuing, and it is the formulation and specification of more sophisticated outputs from databases and existing records systems, bearing in mind that several activities in the Branch are linked, (i.e.) intra-Branch data/information sources are fundamental to several processes.

SECTION 6

TIME LOG SURVEY

All members of the Branch participated in a time log survey during the two weeks of 27 January - 07 February 1986. Generally such a survey is conducted pre- and post-automation to ascertain the impact of automation upon the time spent by individuals during their conduct of daily operations. The survey focussed upon the general categories of the acronym G.R.A.T.I.S., although some work was a part of a miscellany of activities. A total of 59 activities were considered within the G.R.A.T.I.S. component and an additional 13 activities were classified as miscellaneous. The various elements within each component are noted in Appendix N.

The survey was conducted during a period of normal operations, i.e. just prior to the annual submissions of capital requests from school boards, and therefore can be considered to be a baseline from which to judge any other activities, should another survey be conducted at another point in the cycle of the operation of the Branch.

The analysis of the time logs was conducted at three scales:

(i) an aggregate level of the Branch;
(ii) an intermediate level of partitions of the Branch, e.g. the Director's office, the Administrative Services section, and the Policy, Planning and Technical Services section;
(iii) a detailed level of individuals, grouped where appropriate, as participants in a specific activity within a major G.R.A.T.I.S. classification.

The intention of this analysis is not just to review at large levels of aggregation what portions of time were spent on activities but to note, where appropriate, what groups of members of the Branch were preoccupied with specific activities. To provide meaning therefore, reference is made throughout the following discussion to an average and a range of time spent by a given number of members of the Branch on specific activities, and therefore does not reflect a section or the Branch wholly.

The analysis focuses upon activities within the G.R.A.T.I.S. classification rather than miscellaneous activities.

Aggregate Scale: The Branch

Seventy-seven percent of all activities conducted by members of the Branch within the survey period was spent on G.R.A.T.I.S. activities, as shown in Figure 11. The other category of activity was miscellaneous activities.

Generally, as shown in Table 4, the group of G.R.A.T.I.S. activities that consumed the largest portion of the time of the Branch, greater than 34 percent, was 'informing', which included meetings, the preparation of correspondence, reports, School Building Board minutes, and word processing, typing, et cetera. The second largest portion of time, more than 23 percent was spent on 'transforming', which includes activities such as the processing of BQRP claims, calculating gross areas, enrolment projections, and sketches and charts, et cetera. 'Storage', which involved filing, consumed on the average about 11 percent of the time of the Branch's members. The other G.R.A.T.I.S. activities, 'generate', 'retrieval', and 'acquire' each consumed about 3 percent of the time of members of the Branch.

Intermediate Scale: Partitions of the Branch

The pattern of G.R.A.T.I.S. activities varied among the Director's Office and the two sections of the Branch. The members of the Administrative Services section of the Branch spent a greater share of their collective time on the G.R.A.T.I.S. activity of transforming, a smaller share of their collective time acquiring, and storing than the Policy, Planning and Technical Services section.

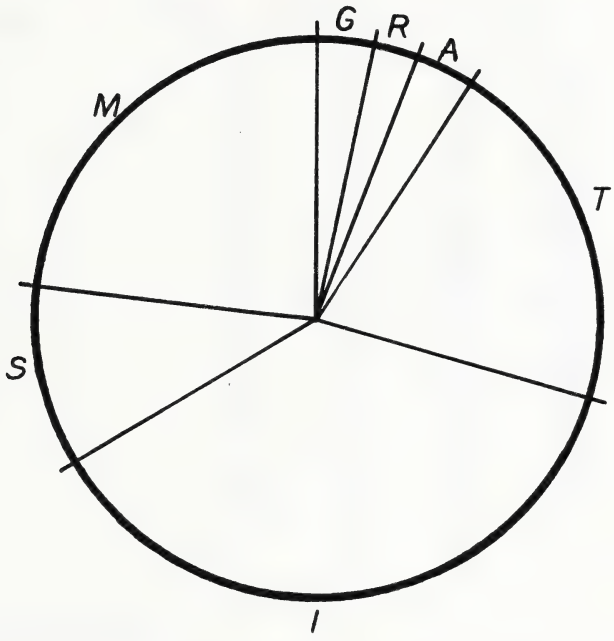
The Director's Office

Activities within the Director's office were substantially different to the two sections of the Branch. This third grouping of members consisted of the Director and his secretary. More than half of their collective times was spent on informing, about 11 percent was spent on storing and about 33 percent was spent on miscellaneous activities, as shown in Figure 12 and on Table 4.

The major portion of the Director's time, more than 88 percent was spent on the activity of informing, and within this category about 60 percent of the time was spent in meetings. Eleven percent of the time was spent on writing memos, correspondence and reports, and more than 7 percent was spent on attending to

FIGURE 11

PERCENT OF TIME SPENT ON G.R.A.T.I.S. AND MISC. ACTIVITIES



Generate	Retrieve	Acquire	Transform	Inform	Store	Misc
3%	3%	3%	23%	34%	11%	23%

SCHOOL BLDGS.
SERVICES BRANCH

TABLE 3 TIME SPENT ON GRATIS ACTIVITIES BY MEMBER OF BRANCH

DIRECTOR'S OFFICE

Name of Individual	Generate	Retrieve	Acquire	Transform	Inform	Store	Misc
KRYS E	0.00	4.29	.26	3.68	16.33	20.25	55.18
KULBA J	0.00	0.00	0.00	0.00	88.29	1.58	10.13
SUB-TOTAL	0.00	2.15	.13	1.84	52.31	10.91	32.66

ADMINISTRATIVE SERVICES

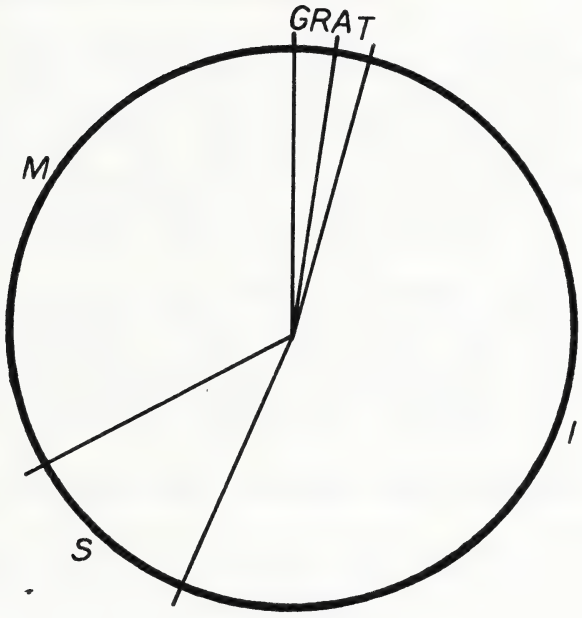
Name of Individual	Generate	Retrieve	Acquire	Transform	Inform	Store	Misc
BERLIN F	0.00	0.00	0.00	10.87	26.63	0.00	62.50
BOYER K	0.00	1.82	0.00	9.80	63.20	0.00	25.19
GRANT L	5.21	3.26	0.00	10.42	54.72	0.00	26.38
GOUGH T	3.02	2.06	.55	37.64	22.66	0.00	34.07
JOHNSON J	6.02	3.21	.27	33.88	17.80	.07	38.76
KUBICA E	0.00	0.00	0.00	20.64	39.31	12.73	27.32
PYRCH A	0.00	14.01	0.00	0.00	2.28	70.06	13.65
NAH N	0.00	.89	0.00	4.94	49.37	11.14	33.67
McLEAN D	25.81	1.61	0.00	33.75	8.44	0.00	30.40
OSINCHUK C	0.00	1.56	0.00	78.26	18.23	0.00	1.95
PARDELY E	19.73	0.00	0.00	16.86	14.56	0.00	48.85
PHILLIPS A	.14	1.63	0.00	88.85	5.18	4.21	0.00
SANGHA H	0.00	.38	0.00	6.27	70.33	12.28	10.74
WELESCHUK M	11.76	0.00	0.00	.38	58.45	0.00	29.41
WILHELM R	.12	0.00	0.00	17.52	67.54	4.04	10.78
WILSON A	0.00	2.05	0.00	86.54	0.00	5.77	5.64
WILSON L	0.00	2.75	1.70	57.46	31.02	1.57	5.50
SUB-TOTAL	4.22	2.07	.15	30.24	32.34	7.17	23.81

POLICY, PLANNING AND TECH SERVICE

Name of Individual	Generate	Retrieve	Acquire	Transform	Inform	Store	Misc
CAVANAGH P	1.57	5.75	6.53	68.61	10.32	0.00	7.23
COUSINS D	7.73	1.93	0.00	16.54	35.12	0.00	38.67
CHERNENKOFF E	0.00	6.93	43.57	28.13	14.29	1.63	5.45
FIEDLER R	0.00	5.05	0.00	0.00	66.38	0.00	28.57
FORSTER J	15.53	1.43	.22	11.78	58.48	0.00	12.56
HOWEY R	0.00	2.49	0.00	5.96	19.72	18.12	53.71
KINNAIRD D	0.00	.33	19.12	25.75	46.74	.66	7.40
LE H	0.00	0.00	0.00	4.10	47.66	0.00	48.24
MARZETTI	0.00	1.30	31.81	12.27	30.94	7.93	15.74
ROSS R	4.77	8.18	0.00	24.20	48.52	0.00	14.32
STELTER D	0.00	2.84	0.00	0.00	28.86	59.09	9.20
YAM A	0.00	.51	0.00	0.00	3.56	95.93	0.00
SUB-TOTAL	2.47	3.06	8.44	16.45	34.22	15.28	20.09
BRANCH AVERAGE	3.27	2.46	3.36	23.07	34.35	10.55	22.94

FIGURE 12

PERCENT OF TIME SPENT ON G.R.A.T.I.S. AND MISC. ACTIVITIES



Generate	Retrieve	Acquire	Transform	Inform	Store	Misc
0%	2%	0%	2%	52%	11%	33%

DIRECTOR'S OFFICE

action requests. The major portion of the time spent by the Director's secretary, more than 20 percent was spent on storing information, i.e. filing, and 16 percent of her time was spent on informing, 10 percent of which was proof read.

The Administrative Services Section

The largest portion of the collective times of the Administrative Services section, more than 32 percent, was spent on interaction or informing activities as shown in Table 4 and on Figure 13. The second largest category was transforming (more than 30 percent). A much smaller activity was storing (more than 7 percent). Generating was slightly more than 4 percent, retrieving was slightly more than 2 percent, and acquiring was virtually negligible requiring less than 0.2 percent.

Miscellaneous activities, such as answering the telephone, travel, photocopying, and ordering supplies consumed about 24 percent of the time. It has been noted that participating in travel offers an opportunity to discuss activities with other members of the Branch, but for the purpose of this survey, travel has not been included formally as a process of informing.

The Policy, Planning and Technical Services Section

The largest portion of the collective times of the Policy, Planning and Technical Services section, more than 34 percent, was spent on interaction or informing activities as shown in Table 4 and on Figure 14. The second largest category was transforming (more than 16 percent) was followed closely by storing (more than 15 percent). Acquiring was more than 8 percent and the other two G.R.A.T.I.S. activities, retrieve and generate were 3 percent or less.

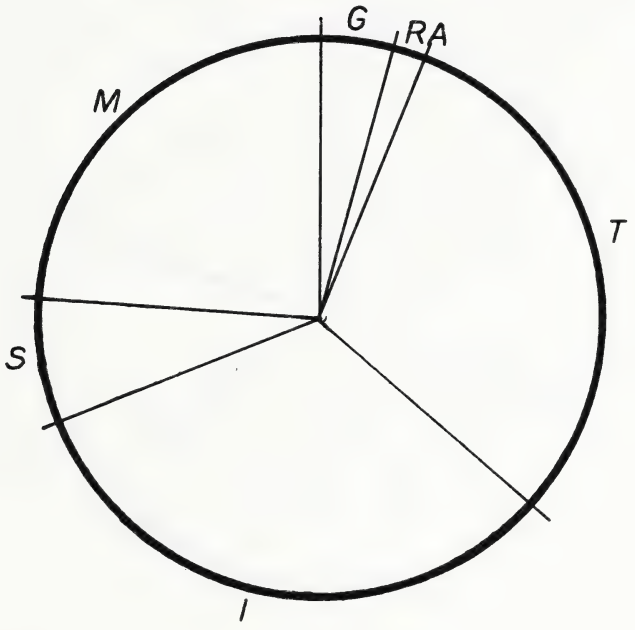
Miscellaneous activities, such as answering the telephone, travel, photocopying, and ordering supplies consumed about 20 percent of the time.

Detailed Scale : Groups of Individuals and G.R.A.T.I.S. Activities

Individuals' activities are summarized in Appendix P. The method of analysis used here places the emphasis upon groups of individuals who are involved in specific activities.

FIGURE 13

PERCENT OF TIME SPENT ON G.R.A.T.I.S. AND MISC. ACTIVITIES

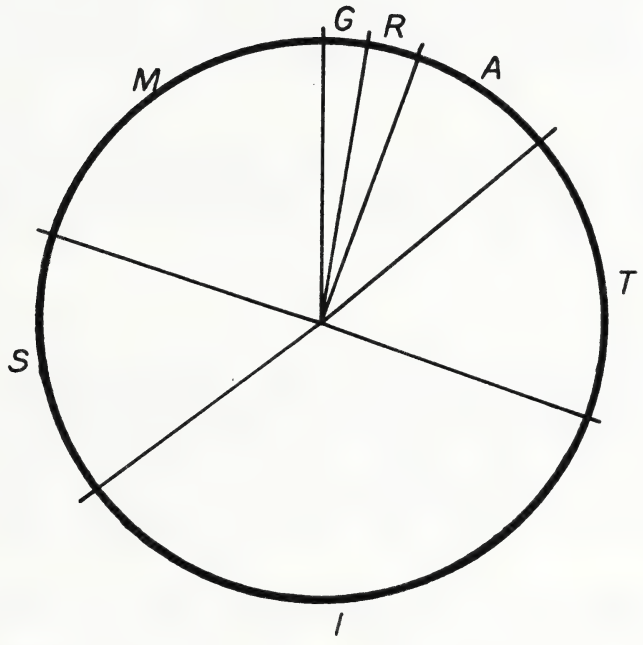


Generate	Retrieve	Acquire	Transform	Inform	Store	Misc
4%	2%	0%	30%	33%	7%	24%

ADMINISTRATIVE
SERVICES

FIGURE 14

PERCENT OF TIME SPENT ON G.R.A.T.I.S. AND MISC. ACTIVITIES



Generate	Retrieve	Acquire	Transform	Inform	Store	Misc
3%	3%	8%	16%	34%	16%	20%

POLICY, PLANNING &
TECHNICAL SERVICES

Generate

The aggregate portion of time spent by all members of the Branch on the generation of primary data was very low, slightly more than 3 percent. Although the share of time spent upon this G.R.A.T.I.S. activity was relatively small during the survey period, it can not be overlooked that some members, 12 in fact, did spend a fair portion of their time in this activity.

School Inspections

Twelve members of the Branch were involved with school inspections during the survey period as shown in Table 5. The average time spent was about 7 percent, and the range was 0.1 - 26 percent.

Retrieve

The proportion of time expended on retrieval of data from secondary sources is very low for the entire Branch, however, some members did spend modest amounts of their time on this activity. With the exception of one of the members of the Administrative Services section whose job it was to sort modernization files, virtually everyone else in the Branch who performed this activity was from the Policy, Planning and Technical Services section.

Searching for Files and Other Sources of Information

Eighteen members of the Branch spent 3 percent of their time on the average (the range was .3 - 8 percent) in searching for files or other sources of information. Four members spent 5 percent or more on this activity.

Acquire

The proportion of time expended on acquiring data/information from a primary source generally was very low, and a conclusion is that there is not any routine activity that required significant amounts of time. The two exceptions, however, were sporadic activities that did consume time: the information needs assessment and the energy accounting exercise that is to be used input to the capital plan review.

TABLE 5 SIGNIFICANT FINDINGS OF THE TIME LOG SURVEY

Activities by G.R.A.T.I.S. Type		Number of Members of Branch Affected	Average Portion of Time %	Range of Values Low %	High %
GENERATE DATA					
G 1 :	School Inspections	12	7	.1	26
RETRIEVE DATA/INFORM'N					
R 1 :	Search Data Files, FldPacks, Pers	18	3	.3	8
ACQUIRE DATA/INFORM'N					
	*Not Any Significant Routine Item				
TRANSFORM DATA					
T 2 :	Calculations	7	17	6	38
T 8 :	Calculate Gross Areas/Cap Changes				
T 6 :	BQRP Write-ups (Initial & Final)	6	13	3	25
T13 :	Prepare SBBD Min. & Prep for Mtg				
T14 :	Enter Data in Computer	5	25	12	64
INFORM (DISSEMINATE)					
I 2 :	Provide Info to Sch. Bds.	9	2	.4	6
I 5 :	Meetings	22	13	.2	42
I 7 :	Draft Memos	17	10	.4	35
I 8 :	Draft Letters, Dictation				
I17 :	Write Reports				
I12 :	W.P.:Lets/Memo/Reps/Type SBBD Min	8	27	1	53
I13 :	Print- Items Above				
I15 :	Type Letters Memos, BQRP Finals	9	8	.3	20
I16 :	Type Person'l Forms, Expense Acct				
STORE DATA/INFORM'N					
S 1 :	File Corr/New/Update/Store	7	26	8	60
S 2 :	Re-file Files				

Transform

A major share of time was required for several transforming components, i.e. altering data into useful information, included calculations (7 members in total, five from the Administrative Services section), the preparation of School Buildings Board minutes as well as BQRP and Modernization write-ups (6 members in total, 5 from the Administrative Services section), data entry into microprocessors (5 members of the Policy, Planning and Technical Services section) and Branch accounting (1 member of the Administrative Services section).

Calculations

The range of portions of time spent on calculations was 6 - 38 percent and the average was more than 17 percent for the seven members of the Branch.

Preparation of School Buildings Board Minutes, and BQRP and Modernization Write-ups

The range of portions of time spent by 6 members of the Branch on the preparation of School Buildings Board minutes as well as BQRP and Modernization write-ups was about 3 - 25 percent and the average was about 13 percent.

Data Entry

Data entry into the existing microprocessors consumed on the average 25 percent of the time of the 5 individuals within the Policy, Planning and Technical Services section. The range of times was 12 - 64 percent.

Branch Accounting

Although not affecting many members of the Branch, the accounting for the Branch required 17 percent of one individual's time.

Inform

The portion of time spent on the activity of interaction or informing was the largest of all G.R.A.T.I.S. groups. A large amount of this group activity accounted for meetings, something that generally involved group discussion. Other activities within the informing classification included the provision of information to members of the Branch, school boards, as well as

the preparation of written, and typed materials. The former involves word processing using existing systems in the Branch.

One of the aspirations of the survey was to determine how much time was spent by other members conveying information to members of the Branch. Although there is an information exchange that does exist between members of both sections of the Branch, nothing was recorded by the survey. There are two possibilities that may account or it. Either the exchanges are so brief that they were not recorded as an activity, or exchanges may have occurred during a formal activity, e.g. a meeting.

Meetings

Meetings on the average consumed about 13 percent of portions of time of all members of the two sections. Twenty-two members of the Branch participated in meetings during the survey period.

Providing Information to School Boards

Nine members of the Branch spent time in this activity and about 2 percent on the average (the range was 0.4 - 6 percent) was spent on providing information to school boards.

Drafting Memoranda, Letters, and Reports

Ten percent on the average (the range was 0.4 - 35 percent) of the portions of the time of 17 members of the Branch was spent drafting memoranda, letters, and reports.

Word Processing

Eight members of the Branch spent portions of their times ranging from 1 - 53 percent or 27 percent on the average doing word processing.

Typing

Nine members of the Branch spent portions of their times ranging from 0.3 - 20 percent or 8 percent on the average doing typing.

Storage

Filing/Refiling

The average portion of time spent by all members of the Branch on the activity of storing information is relatively low, however

for 7 members it varied from 8 - 60 percent, and averaged 26 percent during the survey period.

Summary

Most of the activities that have been discussed above are summarized in Table 5. The exceptions are those that are activities of one member of the Branch, e.g. accounting.

It must be recalled that the survey using time logs was undertaken prior to the annual submission of capital requests from school boards, that is, during a period of the Branch's operating cycle when relative calm prevailed. Consequently, some of the times recorded may not represent appropriate amounts for related activities. They must be considered to be a baseline.

An analysis of this information at the various scales of aggregation has provided some useful conclusions. They are:

(1) the three G.R.A.T.I.S. activities that are eligible for attention are transforming, interaction/informing, and storing data/information;

(2) although variations of activities within G.R.A.T.I.S. have been observed among each section of the Branch, the observations do not suggest that one group alone holds a monopoly regarding potential for assistance in their routines and other applications.

Attention during the preparation of an EDP plan for the Branch may wish to focus upon two themes. One theme will be to determine the number of members of the Branch who are involved in a given activity as a means to promote increased efficiency. The other theme will be to focus upon the activities that require a significant portion of the time of those members of the Branch as a means to promote reductions in tedium.

SECTION 7

APPLICATIONS AND POTENTIAL ALTERATIONS

The requirements of any automated system are subject to the desires fueled by the perceptions and opinions of the members of the School Buildings Services Branch and augmented by the knowledge of external experts and interest groups. In fact, an elementary and basic requirement of a system for the Branch has been identified in a recent request for proposal which is noted in Appendix Q, and for which this report will be used as background.

The previous section outlined that several activities warrant automation as an aid to relieving tedium and enhancing efficiency. They were:

(i) Transforming data into useful information:

- calculations
- BQRP write-ups and School Building Board minutes

(ii) Interaction/Informing:

- drafting memos, letters, reports
- word processing
- typing

(iii) Storing Data/Information:

- filing

The implications to advancing the Branch's capabilities through automation are:

(a) more time may be spent considering the implications of decision-making rather than spending significant portions of time attempting to accomplish what are preliminary analyses in advance of making decisions;

(b) greater opportunity to create more sophisticated evaluative methods and mechanisms likely will result, offering senior decision-makers better feedback and a greater sense of a hands-on way of conducting the affairs of government;

(c) provide an increased school facility planning services to school boards;

(d) increase the efficiency of decision-making regarding school capital allocations.

The three basic applications in their simplest states are nothing more than an extension of existing practices and a transfer from one medium to another, i.e. from print on paper to electronic. The requirements of the Branch supercede this elementary need and must envelop several other functions. They are:

(i) integrating the activities of calculations, reporting and transcription of handwritten materials into an alterable memory and storage;

(ii) computer assisted drafting (CAD) and the incorporation of school plan data into a school based data file;

(iii) transmission into and reception of stored information from a network consisting of designated origins and destinations;

(iv) structuring of databases such that formulations, modelling, and projections can be undertaken;

(v) integrating of databases such that existing systems (Apple and IBM) can be used and that exchanges can take place between a warehouse of data and terminals likely central to the School Buildings Services Branch but exchangeable with the Department's databases.

Ease of use and access to the system must be a prerequisite in order to foster interaction and interest by all members of the Branch.

Another observation is that there are various intervals and sources of data and they must be taken into account in order that updates may occur at designated intervals.

General Areas of Application for Advanced Systems

Several functions in both sections of the Branch appear to be eligible for automation. Some may be exclusive to one section,

and others may be applicable to the entire Branch. Regardless, they are:

(i) Administrative Services Section

- preparation of the minutes of the School Buildings Board
- preparation of the financial status of each capital program
- preparation for tracking various activities associated with relevant capital program(s)
- preparation and tracking of the budget of the Branch
- maintenance of all information regarding schools and school jurisdictions currently contained in paper files
- preparation of summaries of capital programs and control factors where appropriate
- preparation and maintenance of databases and spreadsheets that retain and estimate school-based and jurisdiction-based data and information, e.g. capacities, enrolments, area, utilization and equity factors, and any products of these factors
- background data that apply to calculations that indicate government support for capital programs, e.g. support price schedules, distance factors, and other relevant data/information which may/may not alter over time
- maintenance of project logs and other data/information that may be exchanged with other Branches , e.g. debentures associated with jurisdictions and which are recorded by the School Business Administration Branch
- preparation of information packages, e.g. field reports

(ii) Policy, Planning and Technical Services Section

- the preparation and maintenance of energy accounting records for schools
- preparation of the financial status of relevant capital program(s)

- preparation for tracking various activities associated with relevant capital program(s)

- preparation and exchange of data/information with other Branches and interest groups, e.g. demographic and enrolment data

- preparation and maintenance of facility evaluations and estimates of need for schools

This is not to say that other sources of data/information are to be excluded in the net used to acquire intelligence. Other sources, such as other Alberta government departments, as noted in Appendix R could be important to the general data warehouse needed to support planning operations of the School Buildings Services Branch. Further, the future potential for acquiring data/information originating in other groups is likely should they too automate, as noted in Appendix S.

To summarize, several activities vital to the operation of the Branch would benefit from automation, and they are the basic and elementary outcomes of any new system. A reduction of tedium and possibly an increase in efficiency could be generated. The scope of the data acquired for each capital program, as noted in Appendix T, illustrates the parameters involved.

Preparation, as noted above, involves the arrangement of suitable databases such that relevant data may be retained and updated as required.

Any alteration must take into consideration not solely improvements to existing conditions but must look ahead towards a new era of sophistication in the conduct of the business of the Branch and the Department. This new era must incorporate current thinking regarding automation, such as, decision support systems (DSS). One application would be to develop a school building capital decision support system inclusive of EDIS redevelopment.

The new era will contain an enhancement of executive analytical needs through advanced information warehouses, exchanges through networks, which will allow greater sophistication in evaluation, theorizing, formulating, modelling, and testing of the outcomes of decision-making.

SECTION 8

A FRAMEWORK FOR A PLAN OF AUTOMATION

Developmental Framework

The purpose of this section is to provide a link from the foregoing sections that discuss the existing circumstances of the Branch, and the development of a plan of automation. A framework for the plan should include:

(a) basic objectives to be achieved;

(b) a recognition of needs of the Branch;

(c) a statement of alternate models;

(d) impacts to be sustained if each alternative is selected;

(e) a means to implement the plan;

(f) an post-implementation evaluation method, constituting a feedback loop;

The plan will include:

(i) an ideal model of automation for the Branch.

(ii) policies that define how to acquire appropriate hardware, software, and communications equipment;

(iii) a forecast of technological developments and of the evolving needs of the organization;

(iv) a schedule for the phased introduction and assimilation of newer generations of technology as they become available.

It also must involve the analysis of need as noted in the earlier sections of this report, which identified areas requiring improvement, and potential benefits. To be included is the identification of technical limitations, problems, issues and constraints for the development of the ideal model of automation.

School Facility Capital Decision Support Systems

An ideal model of automation for which to strive is one that includes a school building database, a statistical analysis and other manipulation capability, an interaction and display feature, and decision models. An appropriate framework for the above noted aspects of automation is a decision support system (DSS). A decision support system is defined as a computer based system used to support the needs of managers for data and analysis. The focus of this definition on functional capabilities allows a wide latitude for the use of alternate technologies. Hence an understanding of existing computer and communications technology and future directions is fundamental to understanding DSS. New developments in technology is envisaged by researchers such as Treachy[1] will allow improvements in DSS. The concepts associated with these improvements must be a focus for the development of a plan of automation for the Branch.

A main objective of this model for automation will be to provide the members of the Branch with a history of capital decisions, technical assessments and functional needs. This objective is to enhance the achievement of KRA's.

A graphic representation of an ideal School Facility Capital DSS model is noted in Figure 15. The model reflects arguments made in the literature, specifically the works of Treacy[2].

Treacy advocates that future software capabilities must incorporate all four functions, i.e. a database, interaction and display, a capacity for mathematical analysis, as well as incorporating decision models[3], which is different to the limited software that is available currently.

---

1. Treachy, M. E., (January 1985), Future Direction in DSS Technology, Center for Information Systems Research, Sloan School of Management, M.I.T., Massachusetts.

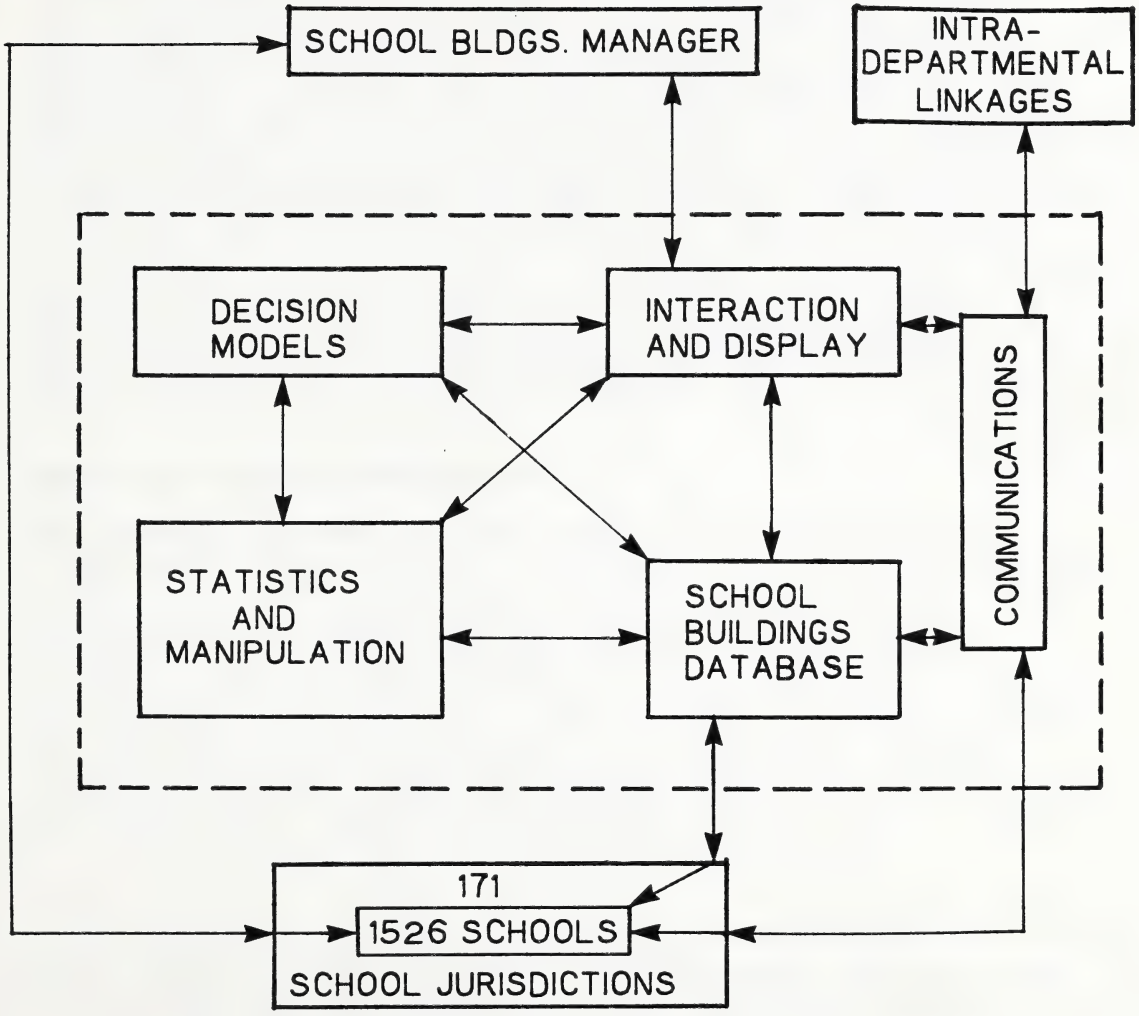
2. -----, (June 1985), Supporting Senior Executives' Models for Planning and Control, Center for Information Systems Research, Sloan School of Management, M.I.T., Massachusetts.

3. Appropriate definitions are the following:

(i) a database can be defined as a stored group of qualitative and quantitative data of school buildings in Alberta;

FIGURE 15

SCHOOL BUILDINGS CAPITAL DECISION SUPPORT SYSTEM MODEL



BASED ON TREACY (1985)

Treacy's perception of emerging architecture of DSS software is that mainframe computers can act as a database management system connected through an active data link to distributed microcomputers. An adaptation of that model for the School Buildings Services Branch is noted in Figure 16. He also notes that changes in software are occurring at a rapid rate. Consequently any consideration and planning for our school facility Capital DSS model should not be impeded by limitations set by existing software. This does not mean that development of a model should proceed blindly but it does encourage our Branch to acknowledge that important changes in software are coming.

Earlier sections of this report have noted existing conditions of data/information and flows within, to and from the Branch, as well as data stored through necessity, related to normal operations of the Branch. The Appendices indicate the general level of detail of information required.

Models for Planning and Control

The potential outcome for the Branch is to concentrate upon formal modelling without building constraints to expansion, i.e. concentrating upon a database solely for the purpose of storage would be an error. Any automated framework must give due consideration to other features, such as, interaction and display, a capacity for mathematical analysis, as well as decision. What this means is that members of the Branch must give due consideration to the formulations required to support not just the existing operations of the Branch and its capital programs, but also expand upon the evaluative techniques available from disciplines that assess what impacts are created over space by the distribution of public funds.

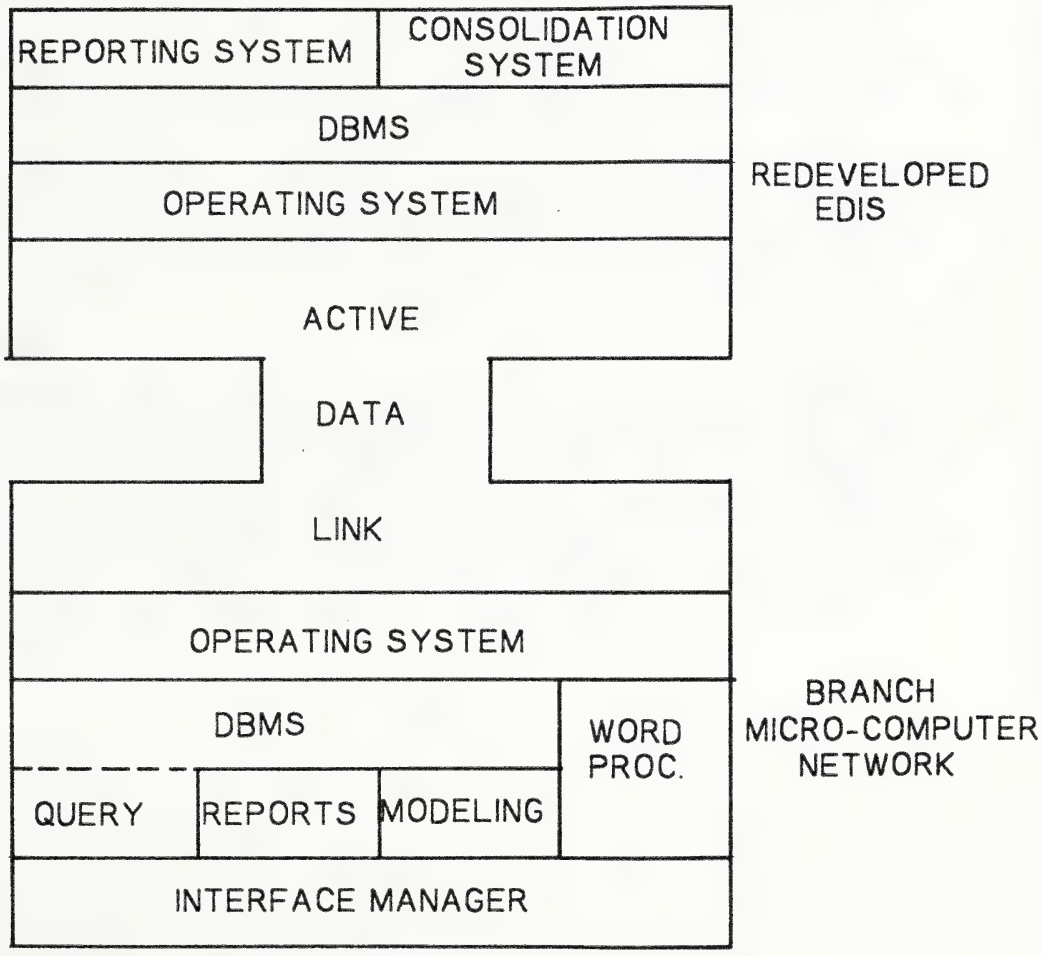
(ii) interaction and display can be defined as the ability to select data and format them into reports and graphs;

(iii) a capacity for mathematical analysis can be defined as any mathematical operation that is to be applied to the data;

(iv) decision models can be defined as the ability to define and resolve complex problems using multidimensional variables. An example of a multidimensional evaluation framework is retained in Appendix U and it could lead to or be a potential school decision model.

FIGURE 16

IDEAL ARCHITECTURE FOR DECISION SUPPORT SYSTEM



BASED ON TREACY (1985)

The design of the model in Figure 16 involves three components:

(a) a data base management system based within EDIS;

(b) a School Buildings Services Branch local area network that would include a data base management system;

(c) software necessary to promote an active linkage between the two. The link would maintain a directory of data for the users of the Branch's LAN and would functionally amalgamate the LAN and the EDIS data base into a unified view.

Networking

The model in Figure 17 is an example of the ideal architecture of a decision support system that could be constructed within the School Buildings Services Branch's local area network (LAN) and a redeveloped EDIS system. It must be recalled that the Branch does not operate in isolation, having extensive linkages with other Branches and other groups beyond Alberta Education. This has been noted in other sections of this report. Consequently, a potential model of an extended network that would include these other groups should they participate in such a project is shown in Figure 18.

FIGURE 17

BRANCH LOCAL AREA NETWORK

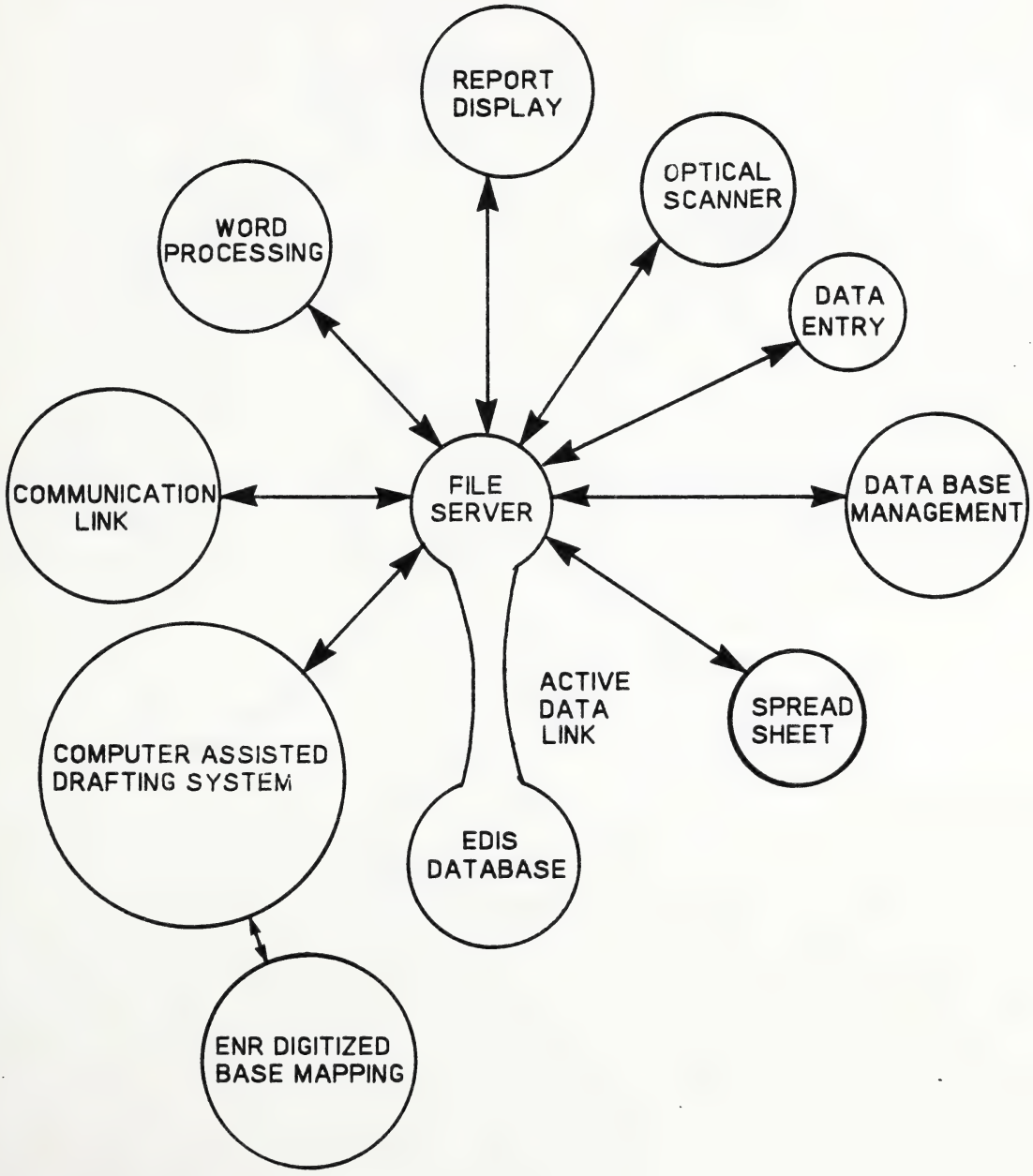
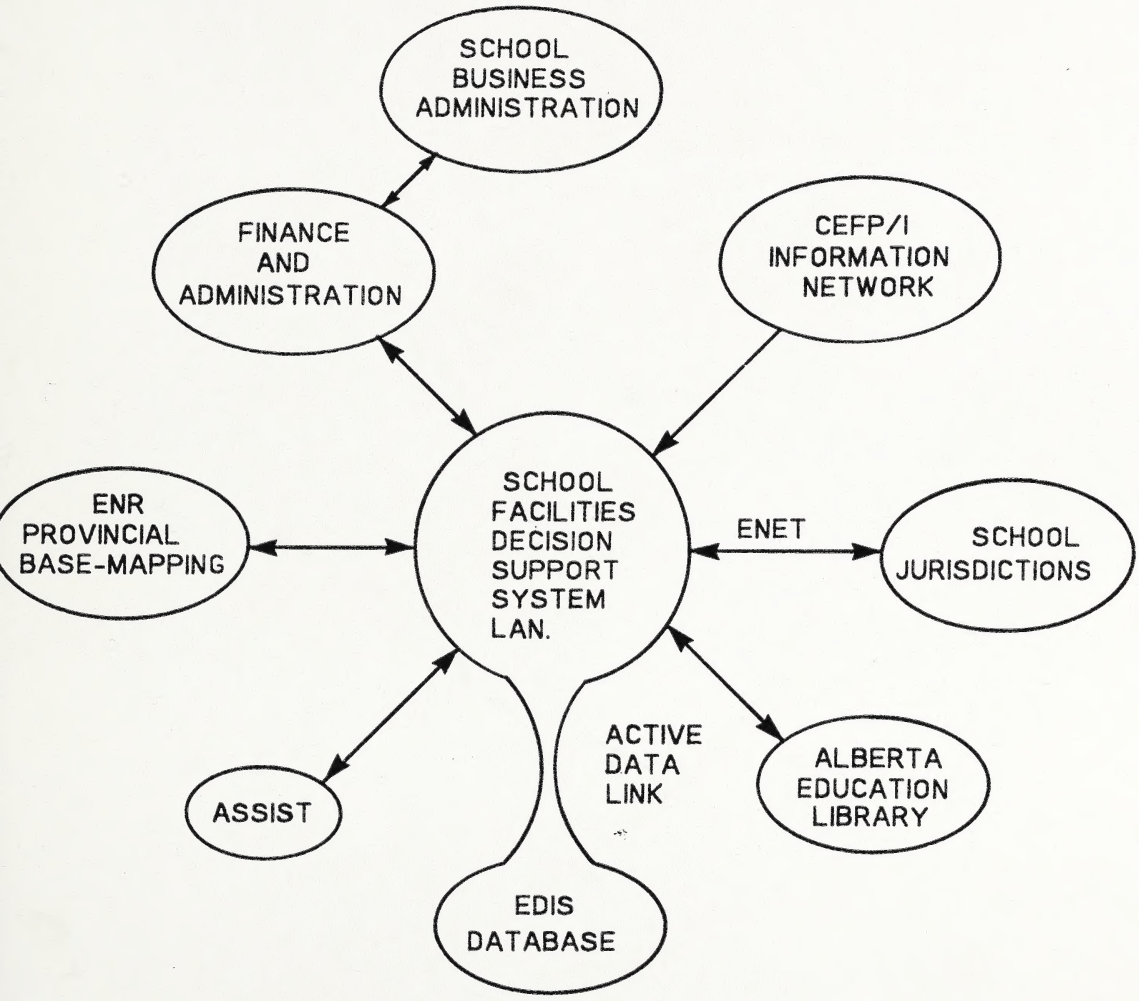


FIGURE 18

EXTERNAL LINKAGES



N.L.C. - B.N.C.
3 3286 06579111 9